BUILDING COSTS REPORT AND OUTLOOK

1st Quarterly Cost Roundup p. 68

ENGINEERING NEWS-RECORD

MAR. 19, 1959

PRICE 50 CENTS

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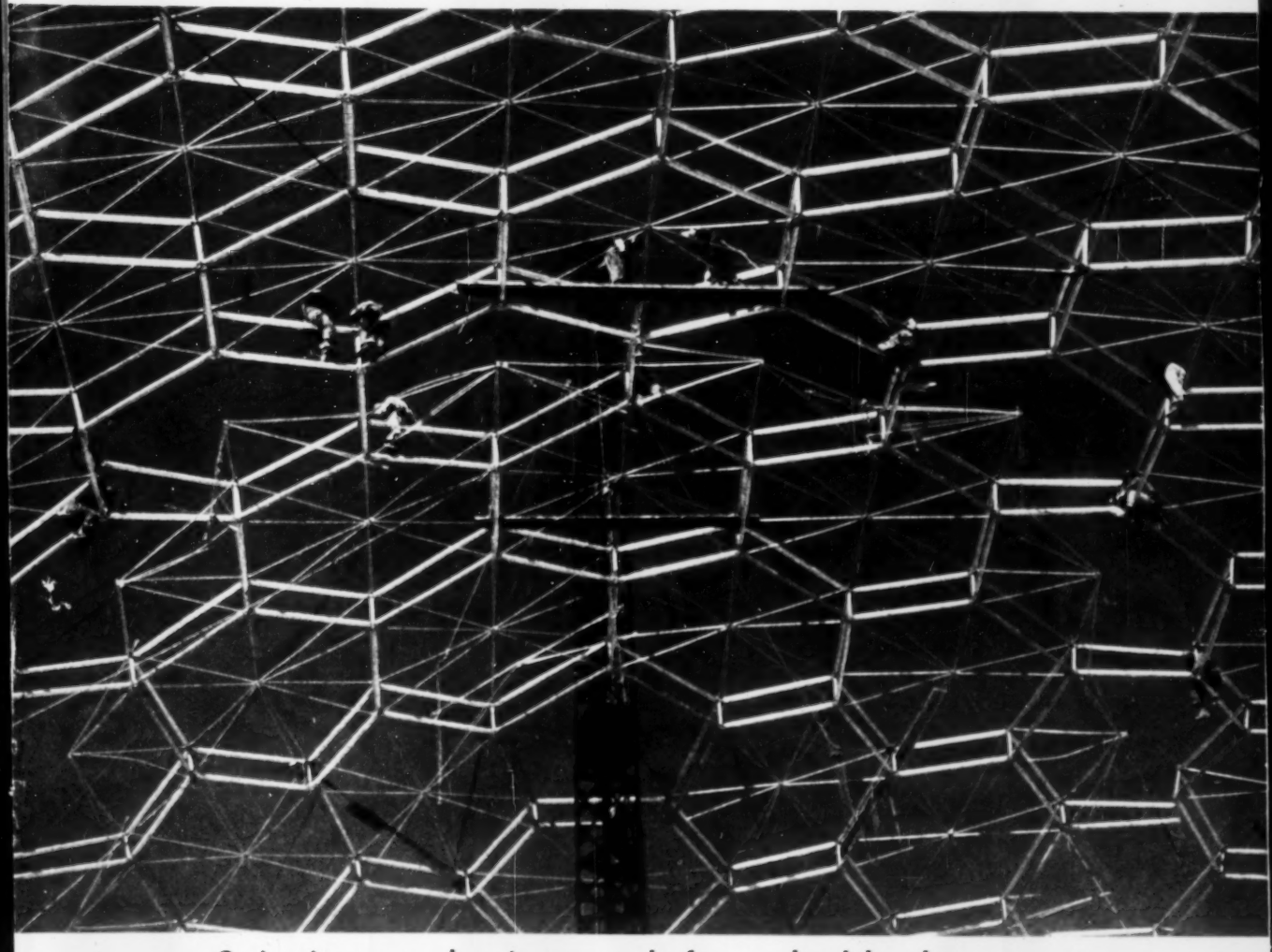
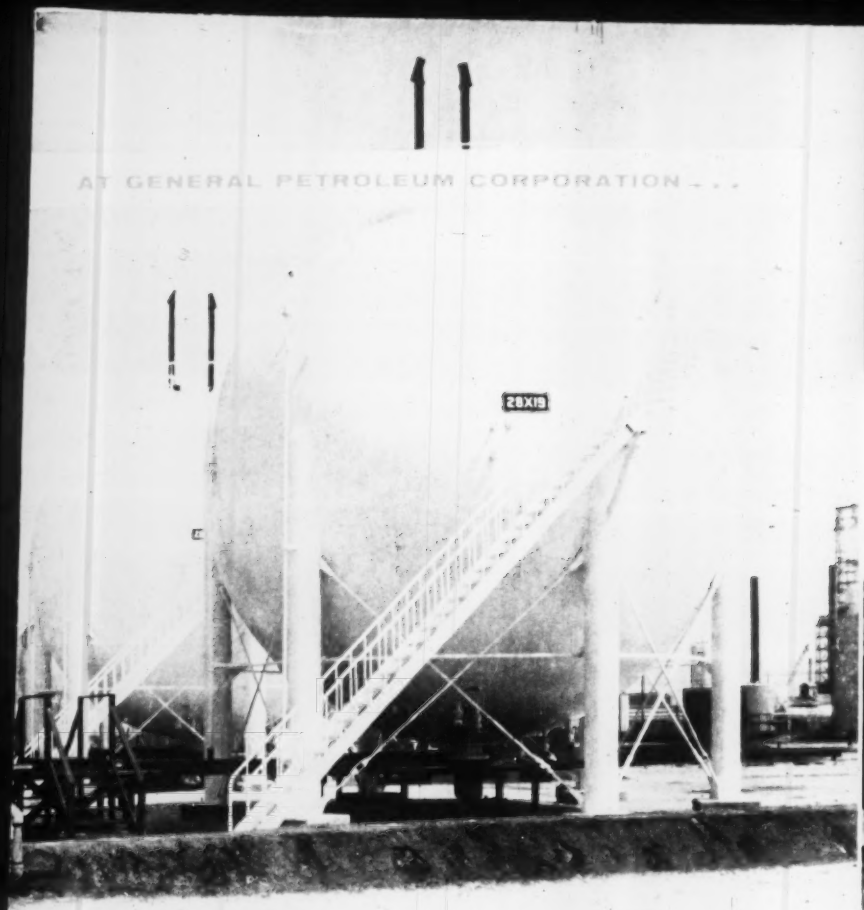


Spinning an aluminum web for a double dome p. 54

A McGRAW-HILL PUBLICATION



Portable X-ray unit used by CB&I to inspect welded seams on field erected work.

Two 31-foot diameter Hortonspheres® designed for 250 lbs. per square inch pressure, store propane at Company's Torrance, California refinery.

Multiple point potentiometer is used to electronically record the temperatures on various points of the structure during stress relieving.

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stress relieved and X-rayed in the field

To meet a specific set of customer requirements, these high pressure, 2,778-barrel capacity Hortonspheres were fabricated at CB&I's Salt Lake City plant and then stress relieved and X-ray inspected *after* they were erected for General Petroleum Corporation's refinery.

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Such facilities point up the many "extras" you get when you specify CB&I . . . the engineering service and attention to metallurgical details that mean a *lot* in today's complex refining operations.

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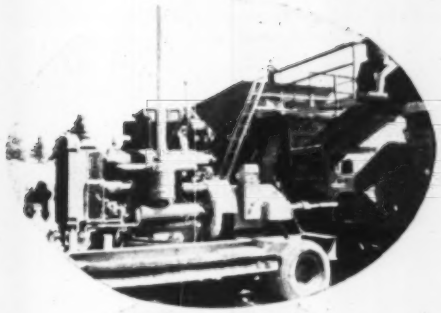

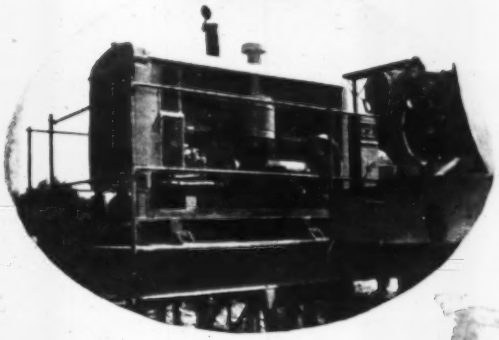

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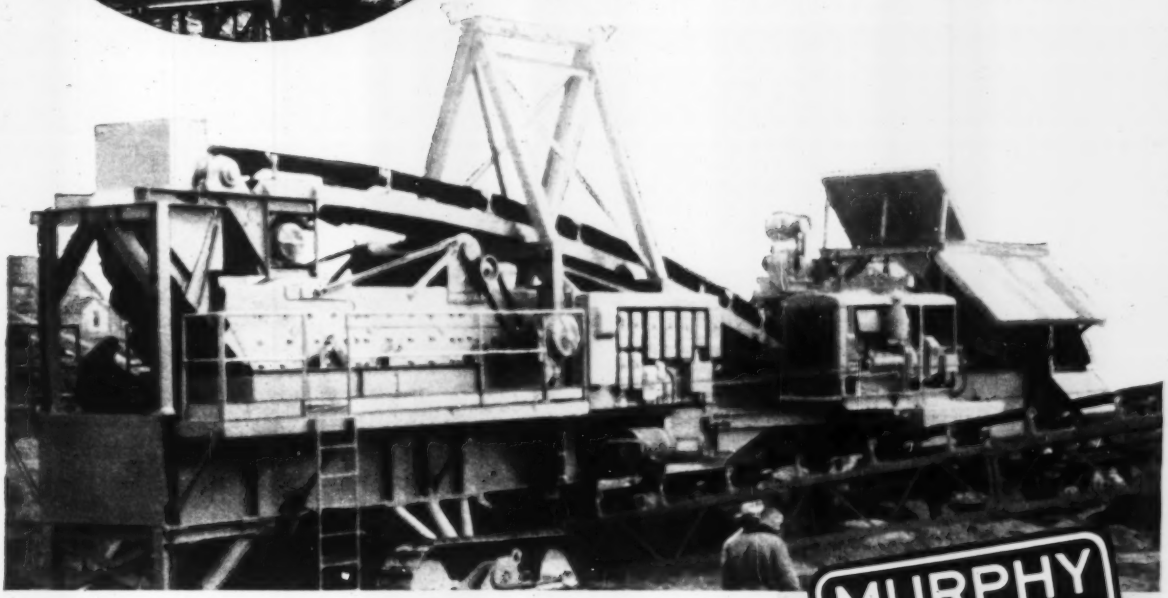
Dependable Job-Site

ELECTRIC POWER

Murphy Diesel Mech-Elec Unit (upper left) supplies electric and mechanical power simultaneously or separately for a portable aggregate plant in the East.

Murphy Diesel Generator Set (left) provides inexpensive dependable electric power for a portable asphalt plant in New Hampshire.

Murphy Diesel Generator Set (below) reduces power-plant maintenance costs on an all-electric scalping plant in South Dakota. A 121 KW Murphy powers the plant.



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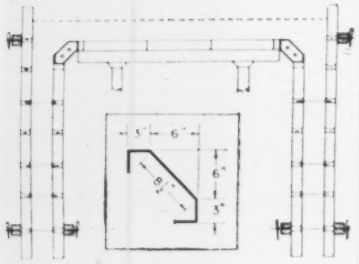
Symons Culvert Forms The Answer

When awarded a contract to build a 340 ft. tunnel, Schweiger Construction Company, Kansas City, Mo., faced the problem of how to do it fast and as economically as possible.

Symons Culvert Forms solved the problem. They eliminated the need for any special form or job-built construction.



Schweiger used Symons 1" steel channel filler horizontally on top of 6" vertical panels on the inside of the walls. Culvert Forms were placed on top of this filler. The forms underneath were stripped with no difficulty and the fillers and culvert forms were then removed without disturbing the decking for the slab, which was left in place for an additional curing period. Walls and top slab were poured monolithically in three pours. *Job was completed in three weeks.*

Symons forms, shores and column clamps may be rented with purchase option. Additional information on *Symons Culvert Forms* is available upon request.

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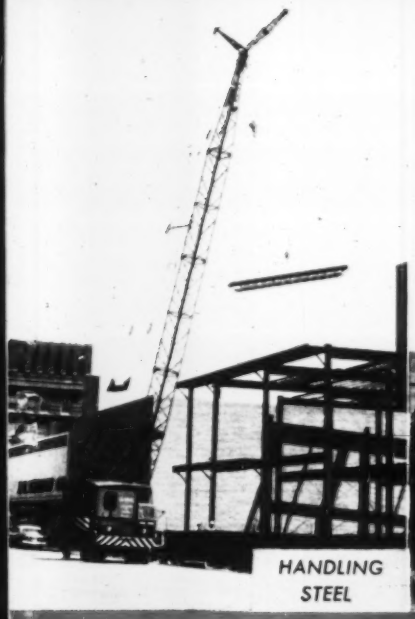

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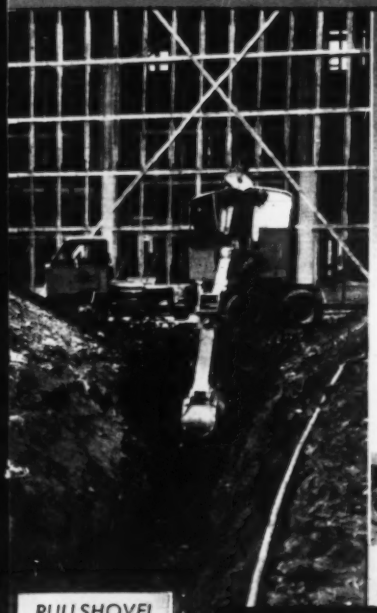

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G-87-1CO

White Oak Excavators meet the deadline at Hogback Dam:

Texaco Plan lets White Oak lube

THESE SIX TEXACO LUBRICANTS, shown here with White Oak Excavators' Vice President, John Toffolon, and H. F. Porter, Texaco representative, permit their rig to lubricate *all* major equipment.

Contractor reports Texaco Simplified

RIVERTON, CONN.—White Oak Excavators, contractors for Connecticut's Hogback reservoir dam, have found that the Texaco Simplified Lubrication Plan makes their truck-mounted lube rig more useful than ever before.

"The Texaco Plan is really essential to getting the best use of our lube rig," says John Toffolon, one of White Oak Excavators owners. "Our Texaco Plan calls for just six lubricants to handle everything on the spread. We can take our whole lubricant inventory right out into the field. That's especially important to us because we use equipment made by practically every manufacturer."

Using no more than six lubricants on this $4,225,000 project has other advantages, too. For example, smaller inventory (six lubricants instead of 15 or 20) means less

HOGBACK PROJECT involves an earth and rock-fill dam to supply water for the greater Hartford, Conn. area. It is 135 feet high and 800 feet wide, and will create a 6½-billion gallon reservoir on the west branch of Connecticut's Farmington River. The dam is designed to discharge 92,000 cfs. It also has a 3 mile tunnel to the Barkhamstead reservoir, and a diversion tunnel designed to carry flood waters up to 31,500 cfs. White Oak Excavators are moving about 600,000 yards of gravel, earth and sand; 500,000 yards of rock; 95,000 yards of impervious soil core; and 30,000 yards of concrete. This requires a full range of construction equipment, all fully protected by the six lubricants comprising the Texaco Simplified Lubrication Plan.

rig handle all field lubrication

Lubrication Plan "essential to best use of lube rig"

handling, less storage space, less chance for misapplication. And, of course, the Texaco Simplified Lubrication Plan developed for the Hogback project comprises lubricants specifically chosen to meet the requirements of that particular job.

Here are the six lubricants, shown at the left with Mr. Toffolon: (1) For engines: *Texaco Ursa Oil Heavy Duty;* (2) for chassis, wheel bearing and general grease lubrication: *Texaco Marfak Multi-Purpose 2;* (3) for hydraulic units: *Texaco Regal Oil R & O;* (4) for transmissions and differentials: *Texaco Meropa Lubricant;* (5) for wire rope and open gears: *Texaco Crater;* (6) for track rolls: *Texaco Track Roll Lubricant.*

You'll save time and money by letting a Texaco Lubrication Engineer work out a Simplified Lubrication Plan tailored to the specific requirements of your project. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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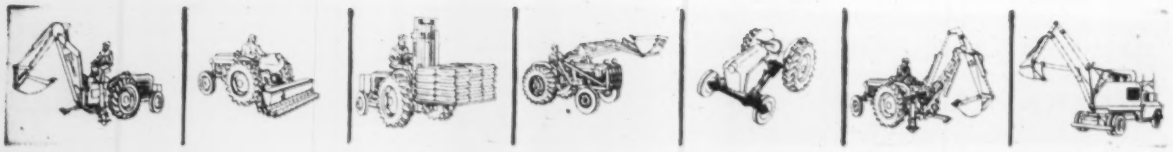

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Here's how your job gets a flying start to success. Goodyear Big-Tire Specialists make a detailed check of every phase of the project: terrain, climate, loads, roads, schedules, speeds and any other pertinent factors. Then they recommend from Goodyear's complete line, the exact tire, tread and cord design that your job needs.

BIG-TIRE EXPERIENCE

Goodyear has built *MORE* pneumatic tires than anyone else. This Goodyear record is your assurance that selection of tires for *your* jobs is based on the broadest practical experience available anywhere and today's top tire-building advancements. For Goodyear paces the industry with the most practical tread and body designs, rubber compounds and Triple-Tough 3-T Nylon Cord – GREATEST TIRE SAVER IN 24 YEARS.

BIG-TIRE SERVICE

Finally, Goodyear Big-Tire Specialists help you set up, and even operate, a tire-maintenance program to save you BIG MONEY in man-hours, machine hours and useful tire life. This includes proper mounting, mating and rotating of tires; correct inflation, cleaning and regular inspection to insure that small injuries are found and repaired before expensive damage can result. In fact, Goodyear can, and will, supply any degree of Big-Tire Service that any contractor can profitably use on any job anywhere.

And—BIG TIRE PERFORMANCE
Example: SUPER HARD ROCK LUG

Goodyear has the right tire for every wheel. When the job calls for a wide-base earth-mover tire, for instance, Goodyear's new SUPER HARD ROCK LUG delivers the best all-round performance. This Super Tire, made with the new "square" shoulder design, packs a hefty rubber bonus for stronger bite, longer wear. Yet, it costs no more than conventional wide-base tires. For full details, see your nearby Goodyear dealer, or write: Goodyear, Truck Tire Dept., Akron 16, Ohio.

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Reader Comment

Water main stays after . . .

Flood Undermines Pipe

SIR—During recent heavy rain, Dayton's main water supply line was almost done in by water. About five inches of rain fell in the area January 21 and sent the Mad River out of its banks in the vicinity of the well field that supplies Dayton's water.

The overflow washed out a 15-ft-high levee and exposed 320 ft of a 72-inch reinforced concrete raw water line buried 5 ft below the levee base. Where the washout was strongest, it also carried away the earth under the pipe and left four 16-ft sections of pipe suspended in the fast moving water. The four sections weigh a total of 68 tons, not counting the water inside.

Emergency crews worked around the clock building a sandbag barricade to check the flow of water in the washout. The suspended line remained in service throughout this time, supplying water to the city.

On February 4, the line was drained so that it could be inspected from the inside. The bell-and-spigot joints and the mortar grouting had stood up well. The engineers reported that only two joints in the entire exposed length needed pointing up.

HARRY PRICE, JR.
Price Bros. Co.
Concrete Pipe Mfrs.
Dayton, Ohio

Accepts Challenge

SIR—Your appraisal of the broader market that new demands for construction will create (ENR Feb. 19, p. 39) was most illuminating and encouraging. It touched directly on our own problem when it was stated, "Manufacturers . . . may have to step up their programs to inform the construction industry and potential construction customers on what's new."

As a manufacturer of engineering testing equipment we recognize this as being almost painfully true. Engineering testing in connection with prebid subsoil investigations and asphalt and concrete quality control is a very new concept, yet extremely important, in contracting economies.

Growth in the field of engineering testing in the construction industry will depend upon the supply of specialists and technicians available to the industry to run testing programs. The growth in the number of private materials testing laboratories in the last ten years has been more than four fold in response to the mounting needs of the construction industry.

The great need now is for literally hundreds of technicians and specialists for operating job-site testing facilities for basic control testing of soil and materials. Compaction, sieve analysis, classification, moisture control are simple but necessary tests for soils. Slump, air entrainment, yield and compressive strength are basic for control of concrete. Basic field tests for asphalt include stability, penetration and bitumen content.

It is hoped the next few years will see an increase in the number of engineers and technicians who recognize this new market in the construction industry.

THEODORE W. VAN ZELST,
President
Soiltest, Inc.
Chicago, Ill.

Likes NSPE, ASCE

SIR—I like to read ENGINEERING NEWS-RECORD and its editorials. However, the views expressed in the unity editorial (ENR Jan. 29, p. 92) do not accord with my experiences.

In the past decade, the National Society of Professional Engineers has been the prime factor in getting the general public's respect and regard for the work of the engineering profession. Why submerge this good work by consolidation? Is not there a better way?

I have been trying to find an application blank for joining the American Society of Civil Engineers for the past 25 years. I want to join this great organization. Can you help me?

L. L. MORAN
Morganfield, Ky.

Editor's Note: Application form sent.

(Reader Comment continued p. 12)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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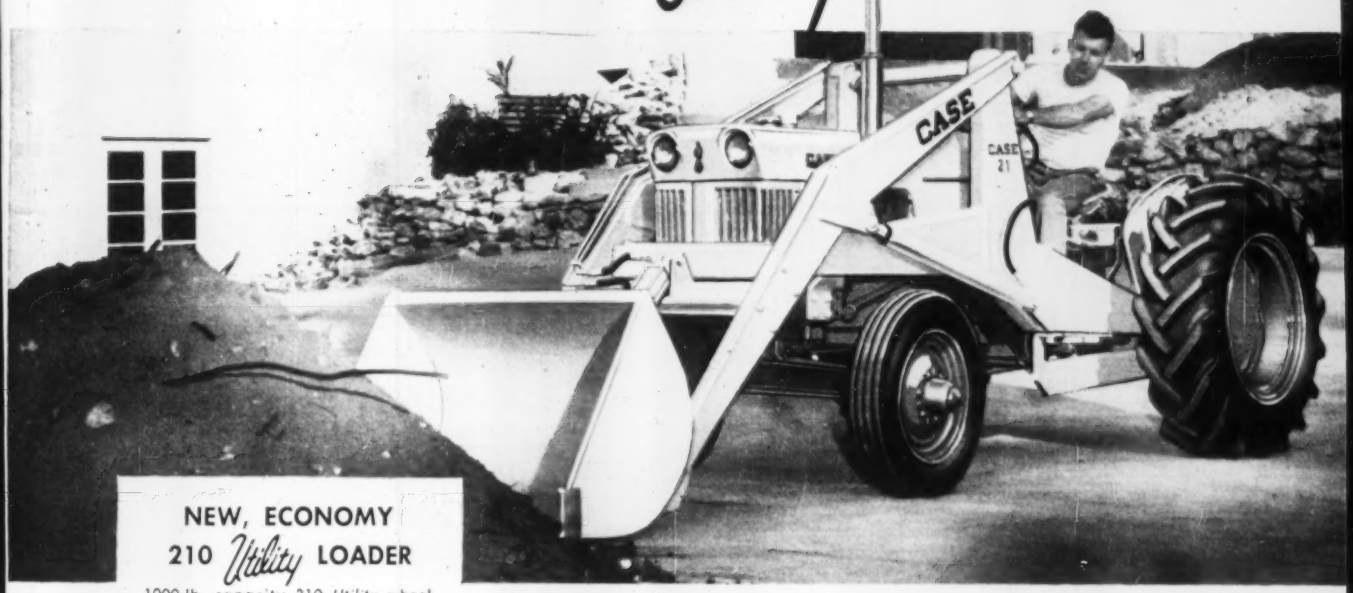
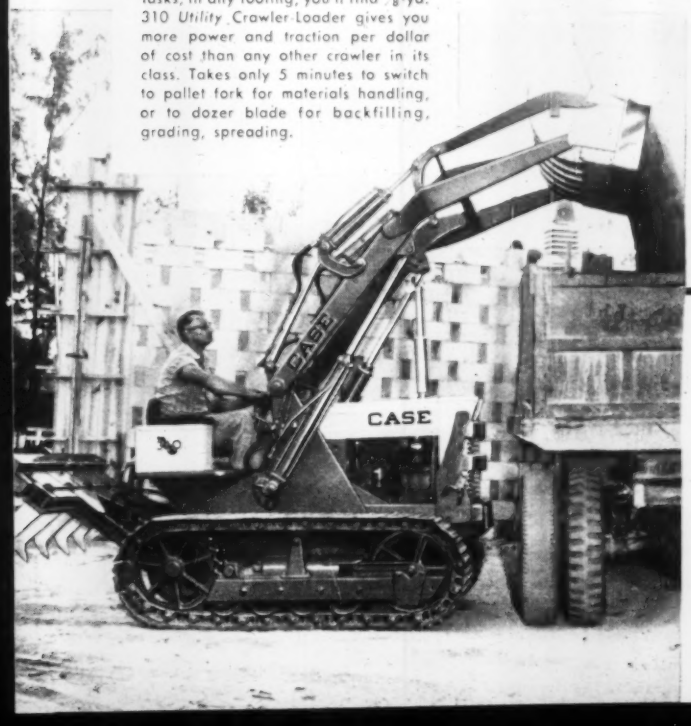


NEW, ECONOMY 210 *Utility* LOADER

1000-lb. capacity 210 *Utility* wheel unit gives you exceptional power and stamina for fast, low-cost handling of small yardage, *plus* "101" odd-lot building chores. Buckets quick-change with pallet fork, dozer, crane or sweeper. Rear mounts 10′ backhoe and a score of efficient tools for grading, landscaping, specialized jobs.

HUSKY, ALL-WEATHER 310 *Utility* CRAWLER

For digging small basements and handling miscellaneous dirtmoving tasks, in any footing, you'll find $\frac{5}{8}$-yd. 310 *Utility* Crawler-Loader gives you more power and traction per dollar of cost than any other crawler in its class. Takes only 5 minutes to switch to pallet fork for materials handling, or to dozer blade for backfilling, grading, spreading.



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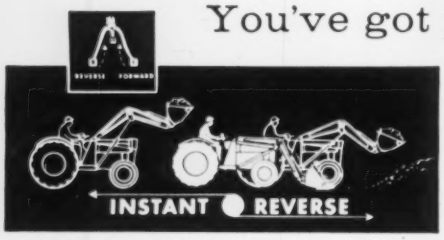
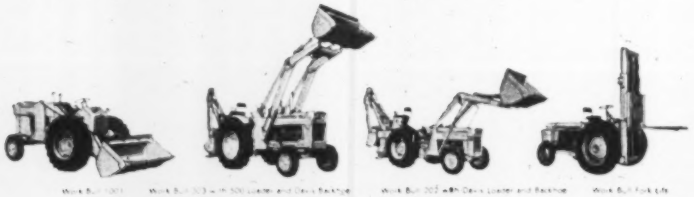


You've got it Coming... or Going on the New WORK BULL 204 with Torque Converter

Massey-Ferguson again shows its leadership in the industrial field with the most important development ever made on industrial utility tractors. This all-new, field-proven Work Bull 204 changes directions instantly, but smoothly, at the touch of your toe – and has a torque converter to maintain correct power-to-load ratio. An efficient 3-point pedal control lets you select forward, reverse, or just engine acceleration. Your hands are free to control the tractor or Davis Loader attachment.

The Work Bull 204 has a high-torque, 40-hp engine with four equal speeds in either direction to provide a wide work range as well as a favorable road speed. It has full-time power steering, individual left and right brakes, and a hand throttle to pre-set engine rpm for operating attachments. The exclusive Ferguson 3-point hitch provides hydraulic draft control for rear-end attachments. Your choice of new model Davis Loaders, Backhoes, Scarifier-Scrapers, or other power-matched M-F attachments gives you the best all-around rig you could ever own. ***Write for the name of nearest dealer and see him soon.***



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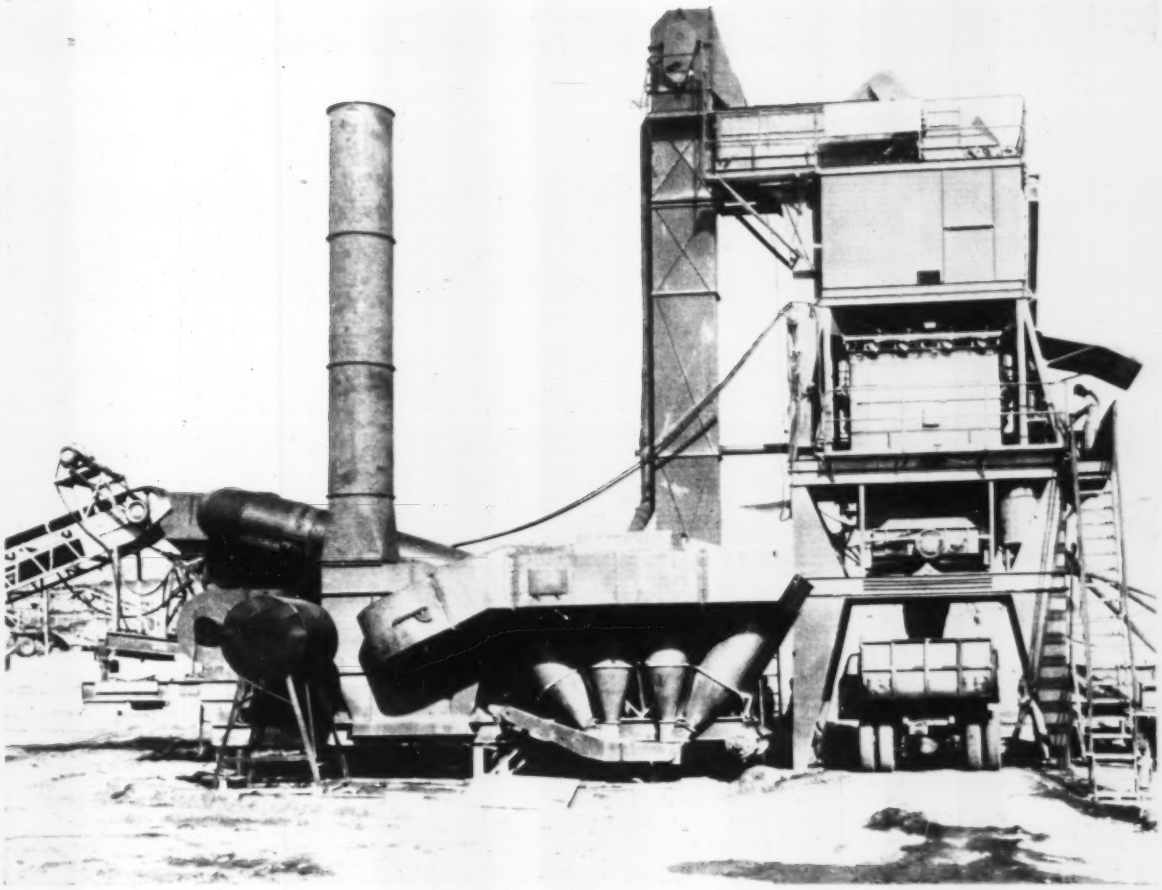

San Ore Construction Company's 6000-pound Barber-Greene Model 896 BatchOmatic, which has been set up at four widely scattered job-sites. Write for your copy of clearly illustrated *Principles of the BatchOmatic.*

Fast, low-cost moving... another BatchOmatic advantage

In its relatively short life this 6000-pound Barber-Greene BatchOmatic has worked on four widely scattered paving jobs. The fact that San Ore Construction Company could move this plant over the highway for these jobs is proof of the superior portability of the BatchOmatic.

The plant was initially set up at Caldwell, Kansas, where it produced mix for Sections 1 and 2 of the Kansas Turnpike. It was then moved about 200 miles to Ellsworth, Kansas, for another road project. The next and longest hop was about 500 miles to Fairplay, Colorado, for paving the upstream face of Montgomery Dam, a job that totaled only 20,000 tons. Its final move of the season was about 100 miles to Fountain, Colorado, for a highway resurfacing project.

Besides their unmatched portability, Barber-Greene BatchOmatics offer:

- Simultaneous measuring of all sizes of aggregate.
- Instant changeover from automatic to manual operation, and from manual to automatic.
- New Dyna-Mix Pugmill which gives thorough coating in less time than any other pugmill.
- Instant, positive inspection of aggregate gradation and weight.

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Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

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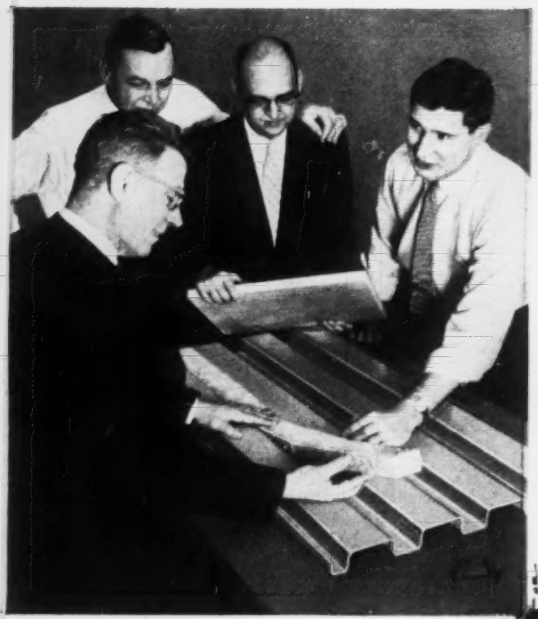
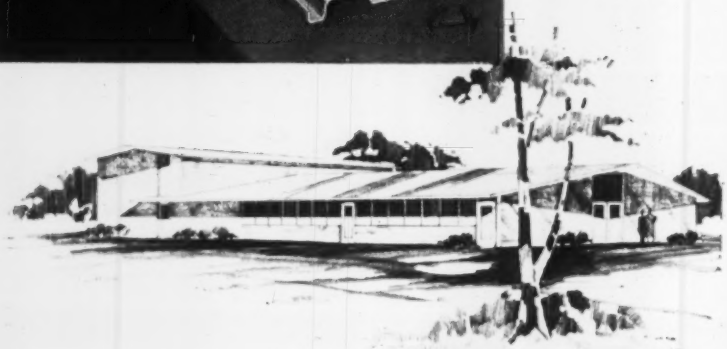


Pre-cut sound absorption batts of inert fiber fit into the 2¾" rib-openings of Acoustideck, under cover of 1" rigid board insulation. Standard methods are used to apply bonded roofing.

Because the acoustic perforations are in vertical webs only, the possibility of dusting is completely eliminated. Spans to 10 feet are practical with Acoustideck.

ARCHITECTS:
Durrant & Bergquist
Dubuque, Iowa
Boscobel, Wisconsin



Milcor Acoustideck cuts cost on roof and ceiling for school

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Tests by Armour Research Foundation show that Acoustideck has a Noise Reduction Coefficient of .70. This satisfies the requirements of classrooms, gymnasiums, tank rooms, offices, industrial plants, and other noise-problem areas.

Acoustideck is Bonderized, then flow-coated with a prime coat of epoxy-resin enamel, oven-baked to abrasion-resistant hardness. It is available also in galvanized steel and aluminum.

See Sweet's Architectural File, section 11a/In — or write for catalog 241.

With Acoustideck, spans to 10 feet are practical. Acoustic perforations are in vertical webs only, where load-carrying ability is affected least.

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. . . Reader Comment

Flood Control Is Vital

SIR—We hope your very informative article, "What Are We Doing About Floods?" (ENR Feb. 5, p. 21) finds its way into places where it will do some good and where it will be seen by many of the "pork barrel "coterie.

The January floods in parts of New York, Pennsylvania, West Virginia, Ohio and certain other areas made thousands homeless. Disruption and property loss is estimated at more than $100 million.

Soon Congress will be considering appropriations for flood control and harbor and channel developments. Then the uninformed and those little interested in the general welfare will begin their annual chant of that moldy cliche, pork barrel.

No other federal expenditure gets closer scrutiny, yet benefits the people and the nation more, proportionate to the outlay. But the pork-barrell derision is a flagrant disregard of facts and the source of widespread misinformation. It is amazing how little is known about waterways improvements, even by some who consider the legislation that makes them possible. Picture the plight of America if these great and beneficial assets vanished overnight.

GEORGE H. PALMER
President and Publisher
Marine News
New York, N. Y.

Forecasts Cut Flood Loss

SIR—Your lead article, "What Are We Doing About Floods?" and your editorial, "Reducing Flood Damage" (ENR Feb. 5, 1959, p. 100) furnish an all-but-complete summary of the situation. The missing item, from our point of view, is flood forecasting.

As you say, not all floods can be prevented; flood-control structures are not always economically justifiable; and flood damages tend to increase as population, housing and industry increase. On the other hand, a timely flood forecast can reduce flood losses by providing the time for evacuation of people, cattle and goods and for other protective measure, including the raising of levees, the closing of flood gates, etc. Such actions, based on warnings, were taken during the floods described in your lead article and have been taken in other floods since. Savings have far exceeded the cost of the forecasting service.

Flood forecasting has been recommended and accepted as one of the alternate methods for reducing flood damages, to be considered in comprehensive basin studies. It is so included and evaluated in the New England-New York and Arkansas-White-Red comprehensive reports.

F. W. REICHELDERFER
Chief, U. S. Weather Bureau
Washington, D. C.

(Reader Comment continued p. 16)

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PRIMITIVE WASHDAY...Washing in a river —inefficient and exhausting—is still done in many undeveloped countries. Clothes never really come clean and are often contaminated.

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We supply much of that pipe. To make sure it's as good as human care, skill and integrity can make it, U. S. Pipe controls every production step. From mining of ore to modern packaging, our pipe is tested, checked and rechecked for quality every step of the way.

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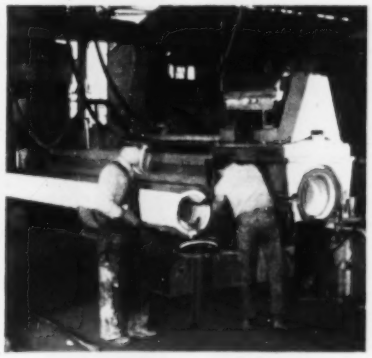
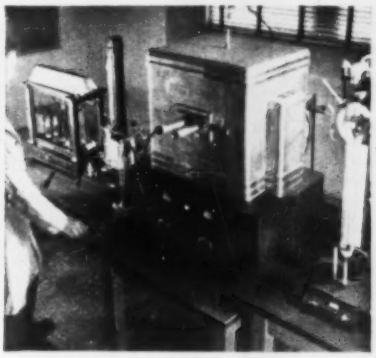
PROBING THE EARTH... Our own iron ore is mined from deposits as much as two miles distant from the portal.



INSPECTING HOT PIPE... U. S. Pipe, just removed from the mold, is checked and inspected for quality.



SCIENTIFIC TESTING...Determining the chemical properties of U. S. Pipe – one of many quality checks.

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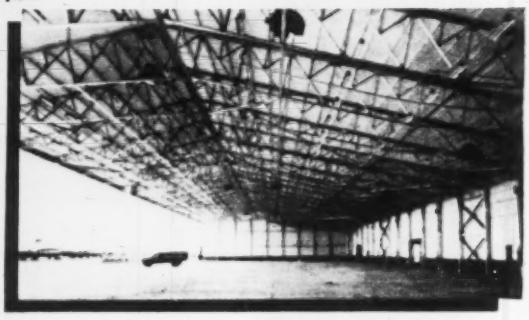

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Erwin Newman Co.

DESIGNERS AND CONSTRUCTORS

U. S. Patent No. 2,687,102

P. O. BOX 1308 HOUSTON, TEXAS

. . . Reader Comment

On Baked Enamel

SIR—In your article, "What Price Colored Buildings," (ENR Dec 25, 1958, p.29) you mentioned aluminum with baked enamel, but gave no cost comparisions or life lasting qualities as compared to porcelainized and anodized aluminum.

Tests indicate that baked enamel on aluminum, depending upon the type and thickness of coating used, will rival porcelainized and anodized aluminum in life lasting qualities. Also, aluminum with baked enamel costs about the same as anodized panels (approximated 20¢ per sq ft), but does not present any problem as to color matching and rejects during fabrication.

One of the most important points is that, in the event the baked on enamel is damaged in transit, or is faded from exposure to the elements, it can be re-painted. Conversely, this is not true of anodized or porcelain enameled aluminum.

We are finding quite a large market for our product which is processed by the new "roller coated method" in coil form prior to fabrication. The paints that we are now using have been developed to the degree that they can be formed after fabrication, unlike any other process which was mentioned in your article.

R. DONALD WIDDOWSON
Vice President in Charge of Sales
Elwin G. Smith & Co., Inc.
Pittsburgh

What Price Publicity

SIR—The caption under the picture of the Seagram building (ENR Nov. 6, 1958, p. 82) states that this facade pays off in publicity. This is a possibility, but it is by no means an accomplished fact. The building cost 80% more than its contemporaries ($45 vs. $25 psf). Seagrams is charging itself $6.36 per sq ft per year rent, while space in other New York buildings is available for $5.00 psf.

If the "excess" cost of the building is considered a public relations expenditure, one must realize that about $19 million was spent for this purpose.

An owner, of course, is free to spend money in any way he sees fit, but there are some interesting public relations alternatives. A one-thousand classroom Seagrams high school donated to the city of New York is an interesting possibility, or, say, forty-four classrooms per year for the next sixty years would spread the better relationship with the public over a longer period. Nineteen million dollars is a lot of PR in one place at one time.

CLAYFORD T. GRIMM
Structural Clay Products Institute
Washington, D. C.

(Reader Comment continued p. 18)

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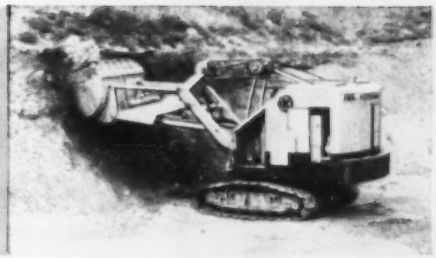

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. . . Reader Comment

Budget Bureau Power

SIR—In your article on the Bureau of the Budget (ENR Jan. 22, p. 24), I believe you just missed a central point of controversy. The bureau establishes criteria for the economic evaluation of projects. Such criteria, for example, could make it necessary for an investigating agency to recommend against a hydroelectric installation as part of a multiple-purpose project because costs compare unfavorably with steam-generated power.

Members of Congress, maintaining that the entire decision-making phase is a legislative prerogative, have, in the past, objected to this power to foredoom a project. This, of course, makes the issue a question of governmental philosophy.

THURMAN T. MORGAN
Wilmington, N. C.

Hire Mr. Eaton?

SIR—Your editorial "An Ill Wind" (ENR Jan. 29, p. 92) admirably summarizes the missile program, and ends with the taxpaper's question: "As a free American, interested in staying free, what else can be done?"

Answer: Do *anything* else!

If one of these engines goes off, by design or accident, it starts war, ends our world. We have faith that mankind can work out problems of freedom, if mankind stays alive. Even freedom is secondary to survival. War is our enemy No. 1, not Russia.

Suppose, for a start, we allot 10% of our military budget, and hire Cyrus Eaton—or somebody like him—to sit down with the Russians and Chinese, and plan against the common enemy—war.

To settle a problem by mass extermination of all concerned is not a sound engineering solution.

HENRY WILLCOX
South Norwalk, Conn.

"Bloopers"—And a Query

SIR—"Bloopers" in your Feb. 19 issue: p. 29: Fargo is in North Dakota, or was 20 years or so ago; p. 133: Wasn't that Ripple Rock, rather than "Riggle Rock" that was blasted out of the Inside Passage north of Vancouver, B. C.?

Question: Why are western railroads opposing full development of the Columbia River along the lines recommended by the new Corps of Engineer report? Can't these people realize that development of the river means more business than ever before for everybody, including the railroads?

Canalization of the Ohio River certainly hasn't hurt anybody in the Middle West and South. How could development of the Columbia ever hurt anyone in the Northwest?

R. F. MIRICK
Seattle, Wash.

(*Reader Comment continued p. 28*)

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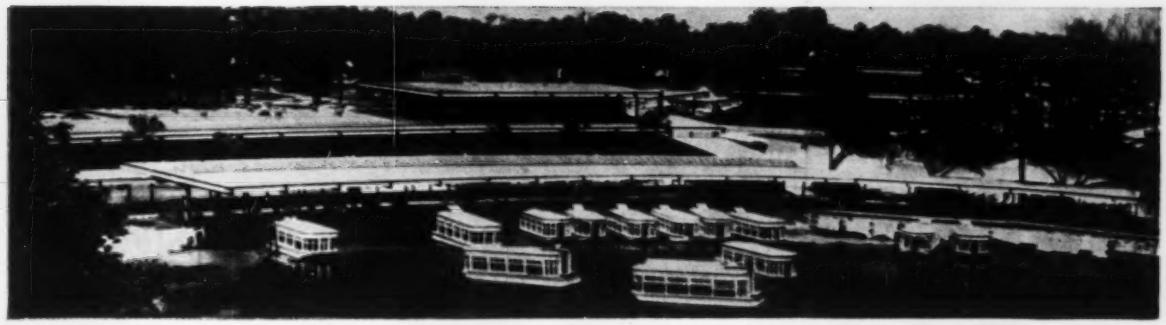

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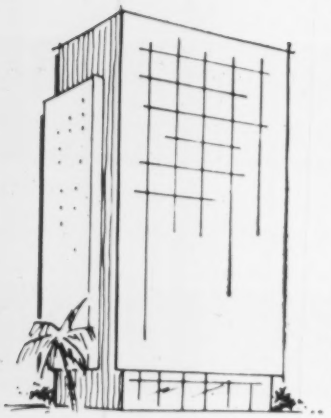

Who are the men with the "golden touch"? They are the architects turning out attractive renderings and perspectives; engineers drawing plans of extensive projects; designers creating bold new shapes and forms, and draftsmen making meticulous drawings and tracings.

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Slick as a Slide Rule!

New JOHN DEERE 5-Position BACKHOE
Shifts Boom in 15 Minutes!

Finished that job of flush digging already? To change the boom mounting for a different job with the John Deere 51 Backhoe, here's all that's required: Just drop the bucket to the opposite side, remove four bolts and *slide* the boom mounting wherever you want it on the pad . . . using the boom's own hydraulic power. All hydraulic connections stay intact. At the outside, it's a 15-minute job for one man, using only a wrench.

For transport, leave the boom mounted at left or right. Boom then folds snug up against pad to make a superbly compact and well-balanced unit for the road. Ask your John Deere dealer for a demonstration.

Some "51" Features

- ★ Simple 2-lever control speeds digging.
- ★ Great new breakout power for hard digging.
- ★ Ground-level reach—20 feet, 9 inches; working depth—13 feet, 6 inches; dumping height—11 feet; boom travel—180 degrees.
- ★ Backhoe can be removed from tractor in five minutes.

JOHN DEERE Industrial Tractors and Equipment

The center-mounted John Deere 50 Backhoe has 205-degree boom swing. In tight spots, digs at 90-degree angles to tractor.

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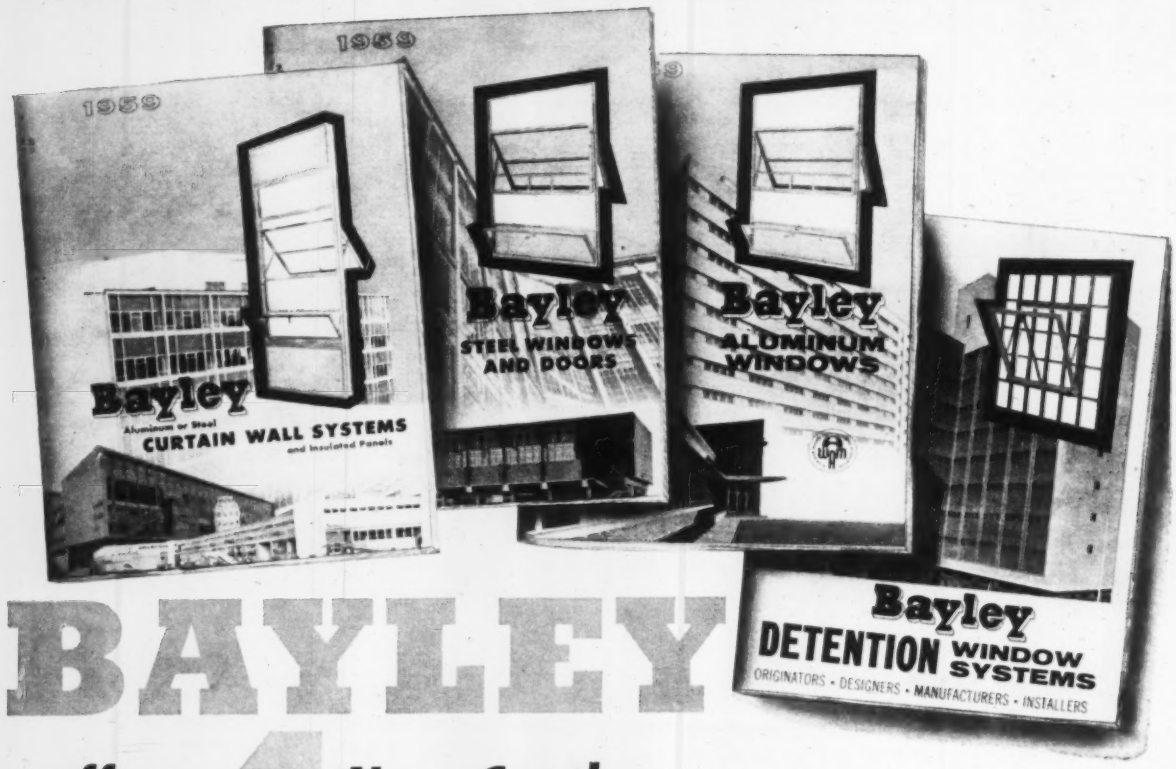
On Windows and Curtain Walls



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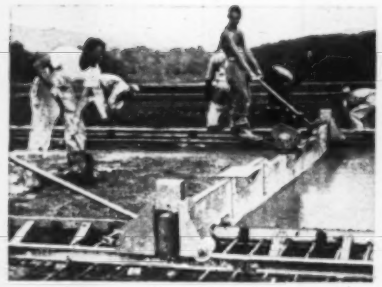
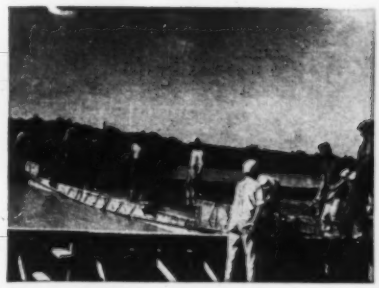
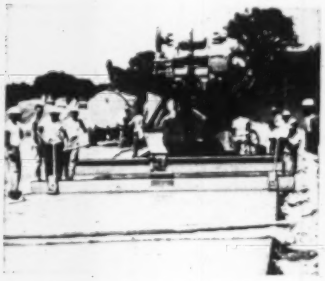


Special underslung beam construction was required for this 14-foot span since the rails were located above the surface of the concrete. Chicopee River Bridge on Massachusetts Turnpike.



Screeding 40 foot wide Bridge Deck—Two STOW 40-foot underslung screeds with two power paks on each used on this expressway.

Rolling Back—The front end-roller automatically flips up to support the screed off the concrete when the operator lifts the handle, making it simple to roll back for a second pass.



Screeding a new third lane on a hill with a 14-foot screed. Burlap was pulled along after screed to roughen surface.

Screeding 2-inch slump floor at new IBM Owego Plant with 25-foot STOW screed.

24-foot, 8-inch STOW screed on housing project. Builder saves 16 man hours per slab.

HOW TO SCREED STIFF CONCRETE

USING VIBRATING SCREEDS. A vibrating screed is used to strike off concrete surfaces and at the same time vibrate the concrete. Because of the vibration, stiff concrete (even two-inch slump or less), can be placed and struck off more efficiently and economically than by hand methods.

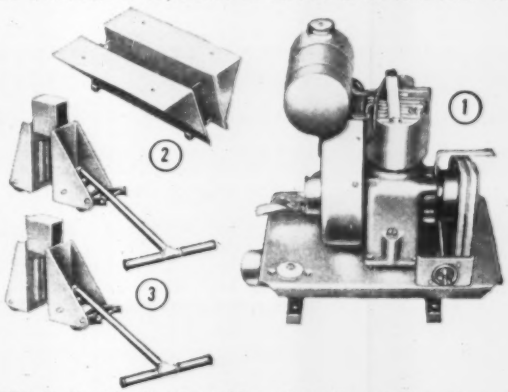
A vibrating screed consists of a vibrating unit mounted on a beam and a pair of end roller and handle assemblies. The vibration is transmitted through the length of the beam directly to the concrete. There is no transverse movement of the beam. The screed is merely drawn directly forward with the end rollers riding on the forms. The Stow screed can be obtained either complete with the beam or as a package assembly without the beam. Complete directions are shown in Stow's Catalog for building your own wooden prestressed screed beam.

ADVANTAGES OF VIBRATING SCREEDS. A Stow vibrating screed, because it does not have transverse movement, permits the building of any reasonable crown or grade into the bottom of the beam to conform to the requirements of the slab.

Vibrating screeds not only strike off the surface and shape it as they are advanced, but they vibrate the concrete at the same time. This means that all of the advantages of vibration are obtained, such as greater density and compaction of the concrete. Because of the vibration, a much stiffer mix can be struck off (two-inch slump or less is recommended). Such stiff mixes are highly impractical to handle by hand methods. A stiff mix, of course, makes a much stronger concrete. Stow vibrating screeds have rubber vibration dampers between the end roller assemblies and the beam which rides slightly above the forms. This practically eliminates vibration from being transmitted to the forms.

A means is provided to make it simple to raise the beam up slightly off the surface. On the Stow screed, the front rollers are balanced in such a way that by just lifting up on the handle, it pivots the roller into a position that holds the beam up off the concrete. This is important since it makes it simple to roll the screed back for a second pass. It also makes it possible to stop the screed at any time without any danger of over-vibration.

Not only do vibrating screeds produce a better slab, but they save the contractor a considerable amount of money because of the speed at which they operate. Experience has shown that with the same crew a contractor, even on concrete bridge decks, can often cut his production time almost in half. Also, of course, vibrating screeds are much less fatiguing to operate than back-breaking hand strike-off methods.



STOW JS vibrating screed assembly available for contractors who want to build their own beams. Consists of item (1) a 2½ HP vibrating unit, item (2) brackets for engine mounting, item (3) a pair of end rollers, handles and necessary bolts. (Notice vibrating head underneath engine.)

For more technical data on STOW vibrating screeds, contact your STOW Distributor listed under "Concrete Vibrators" in the Yellow Pages of your phone book, or write for Form 587 and Cat. 580.

STOW MANUFACTURING CO.

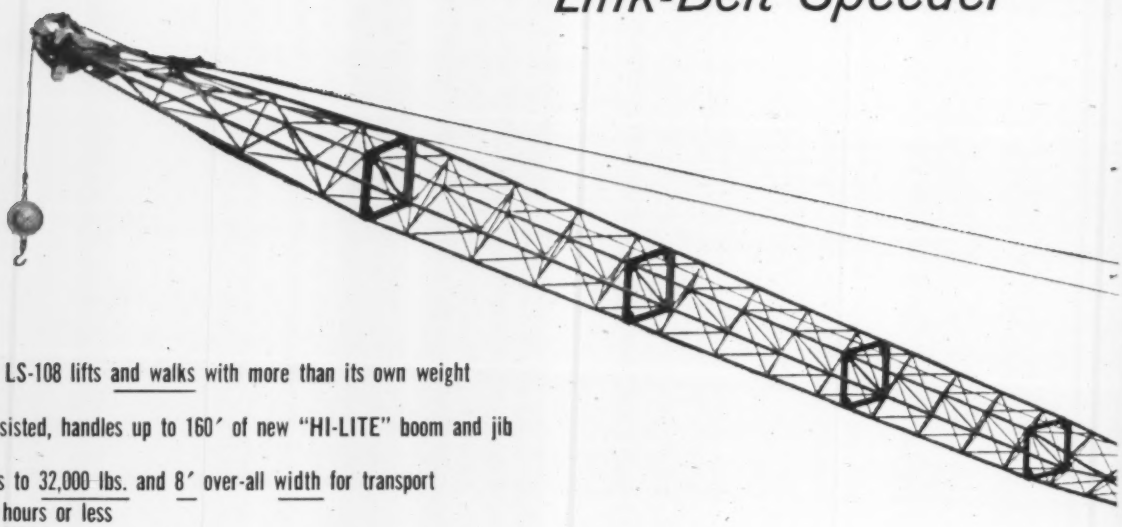
Dept. B-7, 19 Shear St. Binghamton, N. Y.

STOW Manufacturing Co.
Dept. B-7, 19 Shear Street, Binghamton, New York
Please send me full bulletin *"Advantages and Use of the Vibrating Screed"* and Concrete Equipment Cat. 580.

NAME _____

ADDRESS _____ CITY _____ STATE _____

Link-Belt Speeder

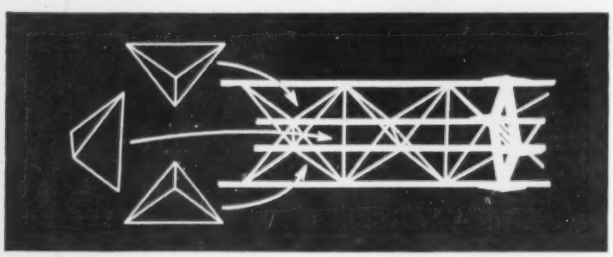


- **New LS-108 lifts and walks with more than its own weight**
- **Unassisted, handles up to 160′ of new "HI-LITE" boom and jib**
- **Strips to 32,000 lbs. and 8′ over-all width for transport in 2 hours or less**

Here's a machine that combines high lifting capacity with exceptional mobility and transportability. Imagine a lifting crane that lifts and walks with 80,000 lbs. and yet quickly strips down for transport from 78,200 lbs. to approximately 32,000 lbs. and an 8 ft. overall width in two hours or less.

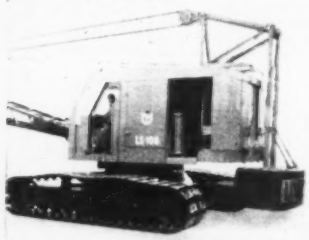
In addition, compare this list of lifting crane features with any other crane on the market: power hydraulic controls, two-speed travel in either direction, reversing clutches for either or both main operating drums, independent swing and travel, independent rapid boomhoist with boom-lowering clutch, powerful third drum and many others.

See your Link-Belt Speeder distributor for new catalog and full information or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,707



Revolutionary "HI-LITE" booms feature new tetrahedron design that virtually eliminates the effect of whipping, twisting and deflection normally experienced with long booms. Sets of internal cross-braces meet at common points along the 44″ square box section forming scores of tetrahedrons (pyramid-like structures) . . . provide maximum resistance to stress in every direction. High-strength steel tubing is light weight . . . permits longer booms than previously possible.

2 hours or less to strip down from 72,800 lbs. to approximately 32,000 lbs. and 8′ width for road transport.



1. Use the powered retractable gantry to remove counterweight.

2. Move LS-108 onto lowboy from the side, taking advantage of power steering.

LINK-BELT SPEEDER

21 crawlers | 6 truck-cranes | 4 self-propelled

It's time to compare . . . with Link-Belt Speeder

announces

NEW 40-TON CRAWLER CRANE

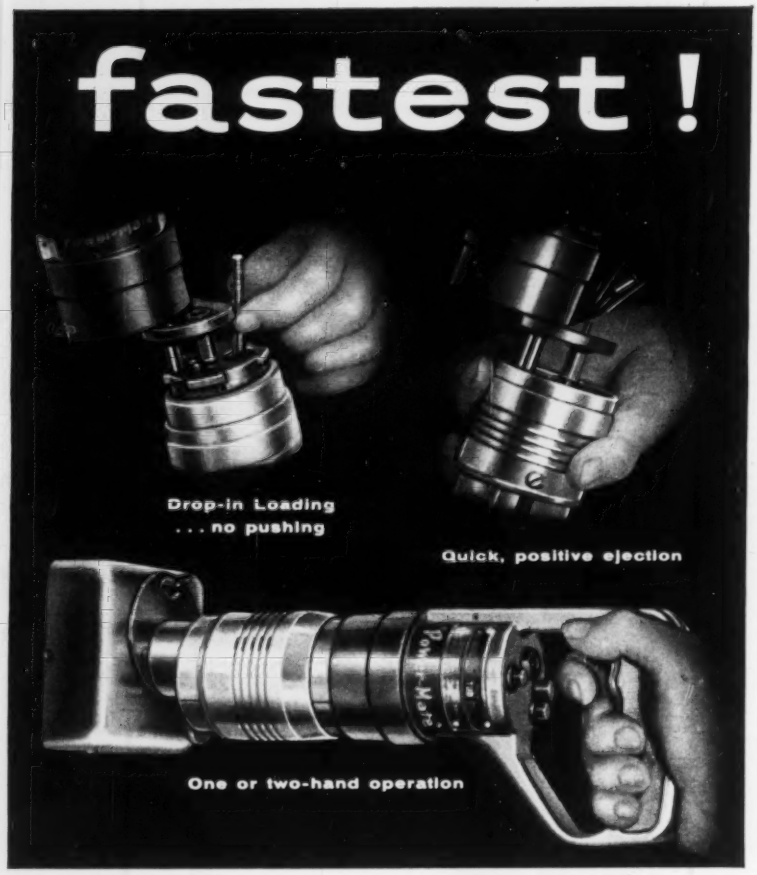
An entirely new low-cost concept in 40-ton lifting cranes is introduced by the LS-108! Convertible to standard hoe, clamshell or dragline attachments. The economical LS-108 is built to carry heavy loads in continuous service . . . and access for service is exceptionally easy.

3. Block up and remove one crawler side frame without assistance from auxiliary crane.

4. Block up and remove other crawler side frame.

5. After removing attachment (and with crawlers on separate trailer) you are ready to go at only 32,000 lbs. and 8' width.

Remington Stud Driver



Loads in seconds . . . sets up to 9 studs a minute in concrete or steel

Here's the most efficient powder-actuated fastening tool ever designed. It's the new Remington Stud Driver with an *exclusive* combination of features that make it your best buy.

Built for speed, it has fast, easy drop-in loading. With Remington "Power-Guide" studs, no ramrod pushing of stud is necessary. Quick, positive ejection is another timesaver. A flip of the wrist and the fired cartridge pops out. With other tools the chamber bushing must be removed by hand, which is clumsy and slow. And only the Remington Stud Driver can be converted to one- or two-hand operation. No other tool has this feature.

Other advantages: Easy, fan-type opening and closing of tool and instantly interchangeable guards for greater versatility, efficiency.

Send coupon for special booklet that proves why the Stud Driver is the fastest powder-actuated tool—and best for you.

CHOOSE THE POWER MOST EFFICIENT FOR YOU. REMINGTON POWER TOOLS ARE AVAILABLE IN
AIR • ELECTRIC • GASOLINE AND POWDER-ACTUATED MODELS

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Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked below:
☐ Stud Drivers ☐ Air Tools ☐ Chain Saws
☐ Concrete Vibrators ☐ Electric Tools ☐ Flexible Shaft Machines
Name _____ Position _____
Company _____
Address _____
City _____ Zone ___ State _____

. . . Reader Comment

Homebuilding Questions

Sir—Do you really believe that raising the interest rates on VA and FHA loans will sell more houses? ("How to Spur Homebuilding" ENR Jan. 29, p. 92).

Don't you agree that the only advantage of a VA or FHA loan to a home-buyer is that it's cheaper than a conventional loan?

There are, I'm sure, lots of people who could afford to buy a $14,000 home with a 5% loan who couldn't afford it at 5½%. If someone offers them 5% they'll take it. If no one offers them less than 5½% they just can't buy no matter how much VA or FHA money is available.

Raising VA and FHA interest rates may attract more lenders, but it will reduce the number of potential home-buyers who can afford these loans.

FRANK A. GEBEL
Waukegan, Ill.

EDITOR'S NOTE—To the first question, "yes." To the second, "no." Other advantages are the lower down payments and the 30-year term. For fuller explanation, see ENR Dec. 11, 1958, pp. 111-112.

Major Projects Listing

SIR—The summary of "Major Transportation Projects" (ENR Feb. 19, p. 78) lists New York City's Clove Lakes Expressway and Gowanus Expressway as Triborough Bridge and Tunnel Authority projects.

Both of these projects are part of the Federal Interstate Highway System and will be constructed by the New York State Department of Public Works with federal and state funds.

In order to expedite the clearing of the rights of way and to permit the orderly progress of the work, Triborough Bridge and Tunnel Authority has undertaken tenant relocation.

ARTHUR S. HODGKISS
Assistant General Manager,
Triborough Bridge and Tunnel Authority,
New York, New York

First Tie-Back Bridge?

SIR:—Some of our engineers are questioning the "first" announced in ENR's article on the Glen Canyon arch bridge (ENR Dec. 4, 1958, p. 36). The article states that the method of tensioning the tie-back cables is new in bridge construction.

It appears that we used the same method during erection of the aluminum arch bridge over the Saguenay River at Arvida in northeastern Quebec during 1949.

J. S. WALSH
Sales Development Manager
Dominion Bridge Co., Ltd.
Montreal, Quebec

(Reader Comment continued p. 32)

In BATON ROUGE, LOUISIANA

TYLOX®

Rubber PIPE GASKETS

Make water-tight joints . . . speed pipe-laying in spite of tough working conditions

Gumbo! . . . wet, sticky and unstable . . . that's what faced contractors installing Baton Rouge's Longwood Drive Outfall Sewer. And the trench for the line was more like a canyon than a sewer ditch.

How were the terrific excavating costs to be offset . . . the job to be done in reasonable time . . . water-tight joints to be assured? . . . Here's how the designers' specification for TYLOX RUBBER GASKETS laid all three problems by the heels at once:

TYLOX reduces job costs with faster pipe coupling. Common delays like water and "guck" in the trench do not slow up the work. Backfill may be applied immediately. *Flexibility* of TYLOX makes the pipe line itself flexible, permitting safe compensation for pipe angularities, shifting soils and shock overloads. Water-tight joints are assured by the husky *compression* seal that follows automatically when TYLOX-jointed pipe is coupled.

Features like these are why TYLOX was specified for the Baton Rouge sewer . . . why TYLOX is the *one* pipe coupling that fully meets requirements of engineers, contractors and taxpayers alike.

* **PROJECT:** Longwood Drive Outfall Storm Sewer for City of Baton Rouge, La.

ENGINEERS: Edward E. Evans, Consulting Engineer, Baton Rouge, La., and Ray W. Burgess, Director of Public Works, Baton Rouge, La.

CONTRACTOR: J. H. Jenkins, Contractors, Inc., Baton Rouge, La.

PIPE: 72" T & G Reinforced Concrete Pipe with TYLOX Rubber Gaskets, manufactured by Anderson-Dunham, Inc., Baton Rouge, La.

GET THIS TYLOX INFORMATION FOR YOUR DATA FILES

Brochure contains engineering data and illustrated case histories showing why engineers the world over specify TYLOX get long-lasting, leak-proof pipe lines at less cost.

HAMILTON KENT MANUFACTURING COMPANY

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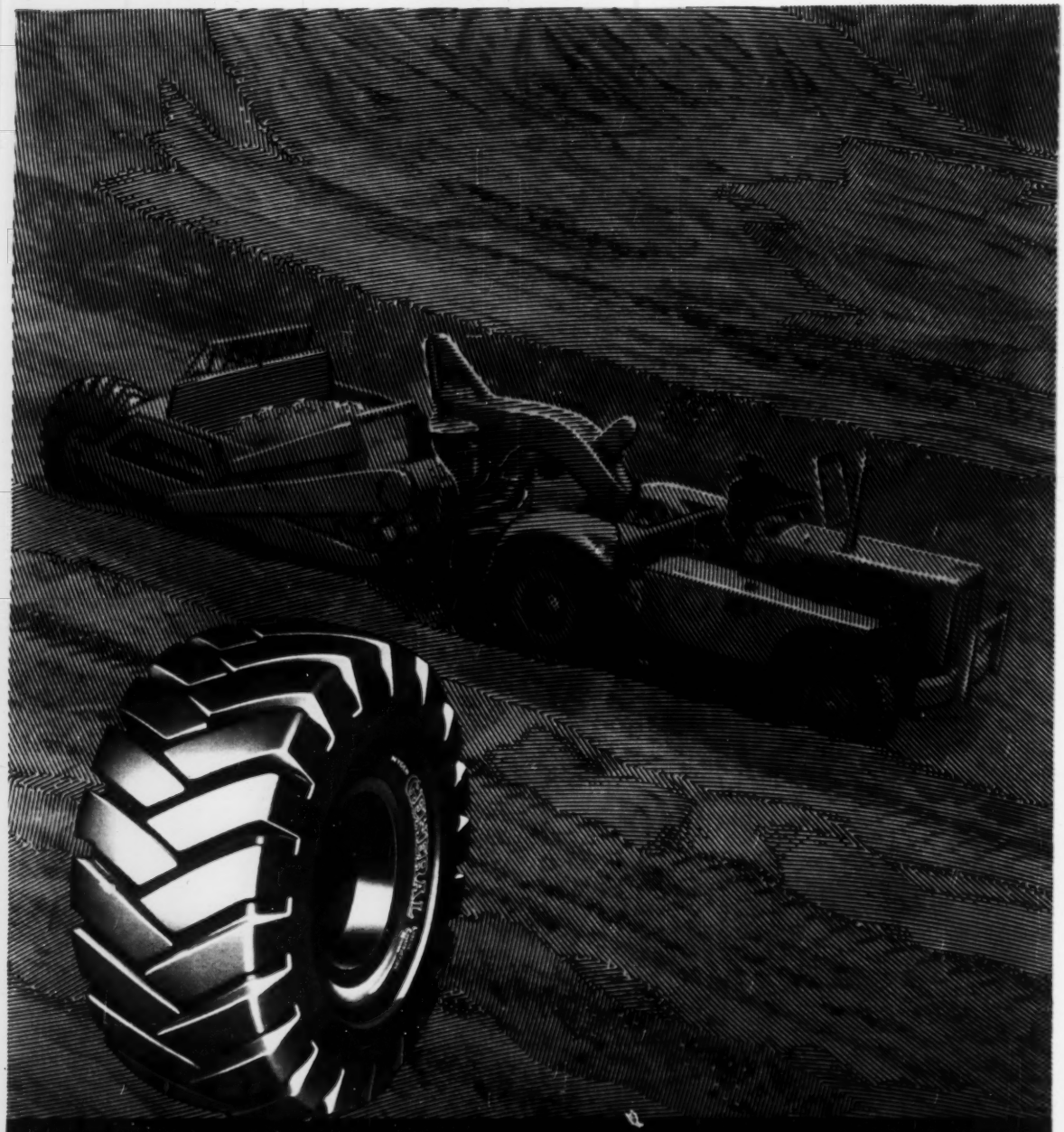


Proved again and again over the roughest, rockiest going in all the world, GENERAL Truck Tires are NYGEN® - built to get every job done faster and for less whether it be in logging, construction, quarrying or mining.

Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

...more pick-up with every pass

DOES YOUR JOB REQUIRE A 15 YARD UNIT?

CURTISS-WRIGHT MODEL

215

CW-215 SELF-PROPELLED SCRAPER
Capacities: 15 cu. yds. struck, 21 cu. yds. heaped, 42,000 pound rated load

SALES • SERVICE • PARTS
at your
CURTISS-WRIGHT DISTRIBUTOR

If it does, don't make a move till you've checked out the self-propelled CW-215 scraper, a 15 yd. struck, 21 yd. heaped unit . . . You can really accelerate the production of your equipment fleet with this 'plus-yardage', medium capacity scraper — which will dovetail right into your present work cycle without upsetting schedules . . . Like all Curtiss-Wright scrapers, you also get a practical combination of unit construction, Roto-Gear steer, constant live winch and positive roll-out ejection. Ask your local Curtiss-Wright distributor to show you a CW scraper in action — he's the man to know if you want to move more dirt at a greater profit to you.

SOUTH BEND DIV. CURTISS-WRIGHT CORPORATION, SOUTH BEND, INDIANA

SOUTH BEND DIVISION
CURTISS-WRIGHT
CORPORATION
SOUTH BEND, INDIANA

Faster CURB and GUTTER LAYING

Smith-Field Automatic Curb and Gutter Machine in operation.

at LESS COST

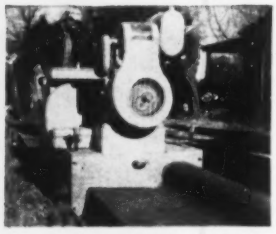
NO HAND FINISHING! NO FORMS!

Lay up to 1,200 feet of integral curb and gutter per day — with no forms or hand finishing. The Smith-Field Automatic Curb and Gutter Machine is doing just that for cities, contractors, builders over the world. Savings of time, labor and material mean money on any job anywhere. The Companion machine — Stephens-Canfield Automatic Curber — lays curbing with the same dispatch, reaching as high as 3,000 feet per day.

The Smith-Field Automatic Curb and Gutter Machine uses Portland Cement Concrete. The Stephens-Canfield Automatic Curbers work equally well with either cement or asphalt mix.

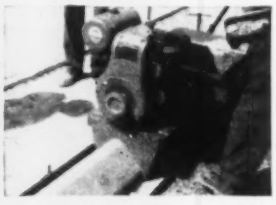
TYPICAL MOLD SECTIONS—65 OTHERS AVAILABLE

LEARN about the savings — the efficiency of these machines. Write for full details and prices.



Smith-Field Automatic Curb and Gutter Machine — Model Mark 3

Stephens-Canfield Automatic Offset Curber — Model 56W



Stephens-Canfield Automatic Curber — Model 55A

E. L. HARDIN ASSOCIATES, INC.

SALISBURY, NORTH CAROLINA U. S. A.

. . . Reader Comment

"Unique" Tunnel Jacking

SIR—I read with great interest your story on the sewer tunnel job which Catapano-Grow Construction Company is doing in Brooklyn, N. Y. (ENR Feb. 12, p. 33). We were fortunate enough to supply the hydraulic equipment for the two tunnel shields used.

The hydraulic equipment and the design of the hydraulic circuit was unique for this type of job. Each shield was driven by twelve 100-ton capacity hydraulic jacks with a 26-in. travel, double acting. The valves were so arranged that any number of these jacks could be operated and controlled directly at the heading so that the shield could be steered for line or grade.

Each shield was also equipped with four face jacks which were designed to hold the breast boards and soldier boards at a constant pressure while the shield was being shoved. This permitted the miners to excavate the face and hold the face during the shoving operation.

Each of these breast jacks was equipped with a special relief valve so that at no time would you get any excessive pressure build up while the shield was moving forward. The compressed oil could be relieved either automatically through the relief valve or manually through a special manual control valve.

Because of the tight space in a 12-ft-dia driven tunnel, the hydraulic pumps for driving both shields were installed "upstairs" at the powerhouse. High pressure hydraulic hose was used for connection between the pipe manifold and the shield in the head.

Another unique feature of the hydraulic installation was the use of a low voltage relay system to permit control of the hydraulic pumping units at the shield. Each shield was equipped with a remote control station which, when actuated by the hydraulic man at the shield, supplied hydraulic fluid to the jacks. In this way, the pumping unit only supplied the fluid on demand, rather than the old-fashioned method of a constant pressure system.

The hydraulic system was designed specifically for this particular job and built with the particular job in mind.

GERALD J. LEVY,
Vice President
Elgood Hydraulics Corp.
Brooklyn, N. Y.

Corps Did Design

SIR—Re "This Track Had to be Straight" (ENR Dec. 11, 1958, p. 49), the Albuquerque District, Corps of Engineers, designed the entire structure in addition to acting as the contracting agency for the Air Force. Ropp & Ropp was consulting engineer.

C. T. KIRKPATRICK
Albuquerque District
Corps of Engineers

(Reader Comment continued p. 37)

SHRINKING PROFITS OR A BETTER RETURN ON INVESTMENT?

3 answers to the problem

With more bidders . . . low bid prices and rising costs . . . the pinch on profits demands a closer look at all phases of your operations. One of the surest ways to improve your profit picture is to use modern earthmovers with big power, big capacity and big performance. When considering equipment you have to weigh facts against fiction. The facts on these three big "Eucs" prove that they can cut your earthmoving costs and bring a better return on your investment.

TC-12

TWIN-POWER
CRAWLER

S-18

21-YD.
SINGLE ENGINE
SCRAPER

TS-24

24-YD. "TWIN"
SCRAPER

EUCLID'S BIG 3

Functional "years-ahead" design
results in 5 major advantages

TWIN

TC 12

CRAWLER

21 to 30 yds.

Best all-around performer in its class!

S 18

SCRAPER

1. Twin Engines, with a total of 425 net h.p. and separate Torqmatic Drives, permit a completely new concept of crawler design. The TC-12 is years ahead of other tractors in its work-ability for push-loading, dozing, ripping and other big tractor work.

2. Independent Track Drives provide almost unbelievable mobility and maneuverability. With separate power trains and Torqmatic Drives, each track can work all of the time with its individually controlled speed and power . . . a big advantage for dozing and push-loading and for work on steep side slopes.

3. Easy, Fast Operation is achieved by Torqmatic Drives . . . one for each track. There's no master clutch . . . change from one speed range to another is made under full power . . . pivot turns can be made fast by reversing direction of one track. Operator has excellent visibility to front and rear, convenient controls and ample room for comfort.

4. Track Alignment is constantly maintained because each track is rigidly positioned to its main frame . . . each half of the tractor oscillates on a big diameter transverse shaft forward of and independent of the final drive.

5. Unitized Assembly of Major Components. Exceptional accessibility and unitized assembly of converter, transmission and drive case components, result in less downtime. For example, both drive sprockets can be removed and replaced in about one-third the time required for a competitive big crawler . . . final drives in just a fourth of the time.

Here's a big power, big performance team that paces the field in low cost yardage . . . the S-18 "Euc" Scraper of 21 yd. struck capacity and the TC-12 Twin-Power Crawler. With 425 net h.p. delivered to the power train and a separate Torqmatic Drive for each track, the TC-12 is the most powerful, most mobile crawler for push-loading. The S-18 loads fast and has a 336 h.p. engine with Torqmatic Drive and converter lock-up for high travel speed, outstanding grade-ability and efficient use of engine power.

Big Capacity of 21 yds. struck, 24 yds. at 3:1 slope and 30 yds. at 1:1 in the low, wide bowl originated by Euclid. By actual scale weight on job after job "Euc" scrapers carry more payload pounds than other scrapers of the same rated capacity.

Converter Lock-up with the 4-speed Torqmatic Drive assures maximum efficiency on grades and long, high speed hauls. The direct drive provides more usable power from the 336 h.p. engine without sacrificing the advantages of the torque converter.

Structural Strength without excess deadweight is built into the S-18 for long service life when push-loaded by the biggest tractors. Simple, rugged construction from push block to cutting blade results in lower maintenance and greater dependability.

Hydraulic Controls for all scraper operations—bowl, apron and ejector—eliminate the expense and down-time caused by cable breakage. All controls are fast acting and completely independent . . . permit controlled spreading of the load and non-stop dumping.

Out-in-the-Open Accessibility of all major components saves maintenance time . . . "package" disassembly helps get the machine back in production faster when repairs are required. Planetary drives and differential can be serviced without removing the wheels . . . engine, torque converter and scraper jacks are out in the open with easy access for servicing.

TWIN

TS 24

SCRAPER

More work-ability than any other scraper

Twin-Power permits the use of two torque converters, each driving a separate axle, to handle big loads under adverse conditions. Maximum usable horsepower of each engine is always available. Either or both engines can be used according to job requirements.

All Wheel Drive enables the "Twin" to self-load in most scraper materials . . . to pull out of soft sand . . . climb steep grades . . . to work when other scrapers bog down. There's no limitation of a power proportioner because each drive axle has its own power train.

Big Capacity of the "Twin"—24 yds. struck—makes it a high production earthmover. Heaped capacity at 3:1 slope is 27 yds. — at 1:1 it's 32 yds. The three independent hydraulic controls for bowl, apron and ejector give fast, positive action . . . help cut cycle time . . . and there's no downtime due to cable breakage.

More Versatility helps beat the profit squeeze. The TS-24 moves the cheapest dirt on big jobs and small ones . . . on work that "can't be done with scrapers" . . . can work independent of other equipment or team up with the TC-12 "Twin" Crawler for the high speed, big yardage projects.

Exceptional Availability of the "Twin" is evidence of Euclid's years-ahead engineering that cuts downtime to an absolute minimum. Major components—engines, transmissions, converters, drive axles, hydraulic jacks—are easy to get to for servicing and maintenance.

EUCLID'S BIG 3 will give you a better Return on Investment.

Performance data on the TS-24 "Twin" Scraper, TC-12 Twin-Power Crawler, and S-18 Single Engine Scraper is available from your Euclid Dealer . . . ask him for facts and figures or a field demonstration.

EUCLID

Division of General Motors Corp.
Cleveland 17, Ohio

Printed in U. S. A.

Another Missile A-E

SIR—We have read the article concerning ICBM bases (ENR Jan. 29, p. 30) in which you have listed the principal designers and builders of these installations. We note that you have overlooked the fact that Stearns-Roger is the architect-engineer for the important missile installation at Francis E. Warren AFB, Cheyenne, Wyo.

As is common with the Air Force, the announcement of our serving them in an architect-engineer capacity for this installation was withheld until the definitive contract was completed. As it happened, our work on this project was almost complete by the time the definitive contract was signed. It was officially announced, however, by the Air Force on Dec. 2 that we were handling this project.

L. B. FISHER
The Stearns-Roger Mfg. Co., Denver, Colo.

For Your Calendar . . .

21st Annual American Power Conference, Hotel Sherman, Chicago, Ill., Mar. 31-Apr. 2.

8th Annual Meeting of the Building Research Institute, Penn-Sheraton Hotel, Pittsburgh, Pa., Apr. 6-8.

National Industrial Conference Board's Seventh Atomic Energy in Industry Meeting, Statler Hilton Hotel, Cleveland, Ohio, Apr. 8-10.

Wisconsin Triennial Engineering Exposition, University of Wisconsin, College of Engineering, Madison, Wis., Apr. 10-12.

National Association of Architectural Metal Manufacturers, Monteleone Hotel, New Orleans, La., Apr. 12-17.

New York's 29th Annual Safety Convention and Exposition, Hotel Statler, New York City, Apr. 13.

Automotive Engineers 10th Annual Earthmoving Industry Conference, Pere Marquette Hotel, Peoria, Ill., Apr. 14-15.

12th Annual Conference for Protective Relay Engineers, A & M College of Texas, College Station, Tex., Apr. 13-15.

Electric Heating Conference, Bellevue-Stratford Hotel, Philadelphia, Pa., Apr. 14-15.

Southeastern Instrument Society of America Conference, Gatlinburg, Tenn., Apr. 20-22.

Galvanizers Committee of the Steel Industry Meeting, Drake Hotel, Chicago, Ill., Apr. 23-24.

Annual General Meeting of Consulting Engineers Council, Biltmore Hotel, New York City, Apr. 28-May 3.

American Society of Mechanical Engineers Metals Engineering Conference, Hotel Sheraton-Ten Eyck, Albany, N. Y., Apr. 29-May 1.

Purdue Industrial Waste Conference, Purdue University, Lafayette, Ind., May 5-7.

International Commission on Irrigation and Drainage Technical Conference, Reno, Nev., May 11-12.

Symposium on Industrial Uses of Radioisotopes, Georgia Institute of Technology, Atlanta, Ga., May 11-12.

46th Annual Convention of the National Rivers and Harbors Congress, Mayflower Hotel, Washington, D. C., May 13-14.

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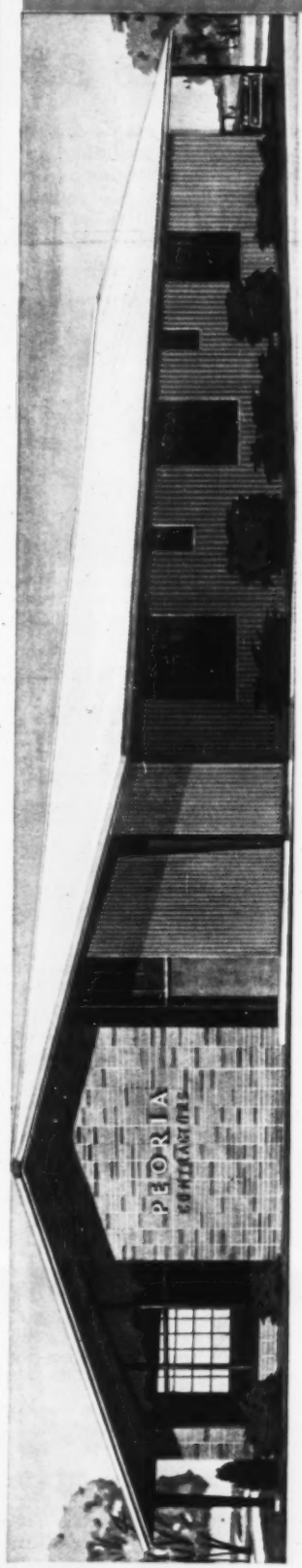

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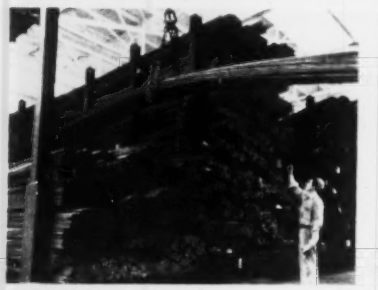

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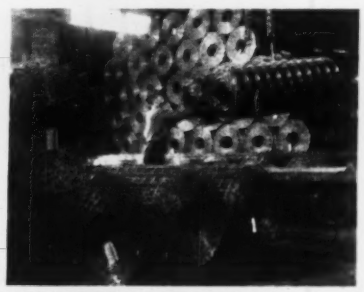

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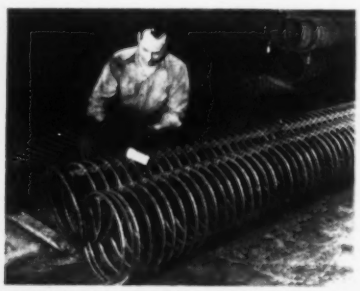

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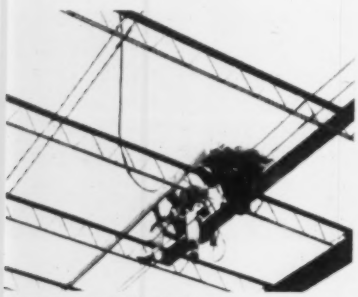

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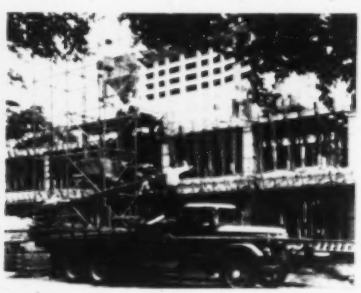

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are now easily available for the previous six months. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

MAKING PICCADILLY CIRCUS SQUARE—The neon lights on London's famed Piccadilly Circus are coming down to make way for a $20-million, 13-story skyscraper. It's part of a complete remodeling into a square for easier traffic flow. Plans call for a second skyscraper, a hotel and pedestrian bridges. Work will start this fall; it's to be completed in five years.

HOUSING SPURT—Private housing starts last month were 44% above a year ago and matched the February record of 87,900, set in 1955. All starts, including public, rose seasonally last month to 89,000. But the seasonally adjusted annual rate of private starts dropped slightly—1,320,000 units, compared to 1,350,000 in January.

CANADIAN EXPANSION—Canada's capital outlays of $8.3 billion in 1959 will be under 1957's record, but new construction starts will top 1958's. Of the 1959 outlay total, $5.9 billion will be for new construction, the balance for machinery and equipment. Commercial, government and institutional building will lead the way.

NEW FLOOD PLAN—Flood plan zoning by local governments should be a prerequisite for federal flood protection, the Tennessee Valley Authority advised Congress this week. TVA sent Congress a report citing successful experience during a six-year test of a TVA plan for preventing the spread of new buildings onto flood plains.

SKYSCRAPERS IN VENICE?—City fathers have come up with a plan to construct a new business center in Venice, the Lagoon City. But some observers think the plan doesn't have as much chance as a leaky gondola. Tradition-minded Venetians don't like the idea of skyscrapers and autos on the streets. Building regulations in Venice are among the toughest in the world.

WRIGHT SITE: WRONG RIGHTED—Madison, Wis., can now start work on a Frank Lloyd Wright designed civic center. The state legislature has repealed a 1957 law that set a 20-ft height limit on buildings constructed on the shore of Lake Monona at Madison. The law was aimed at the Wright project, though it didn't mention it.

NOBODY LIKES THEM—Don't expect to hear anything good about the newly set St. Lawrence Seaway tolls. Canada didn't want any tolls. Inland U. S. interests wanted lower tolls or none at all. East Coast port shippers and competing shippers wanted higher tolls. The big question is: Will the tolls pay off the $471-million investment in 50 years? The Seaway is supposed to be self-liquidating.

While MORETRENCH WELLPOINTS effectively absorb 34′ of water, the contractor excavates 45′ down in fine, silty sand — open cut — to place 96″ diversion pipes — *in the dry.*

This project is part of the Metropolitan District Commission's huge sewage disposal plant for the City of Boston.

Only one pump, pumping on two stages of wellpoints, was needed to keep this deep excavation dry.

Headworks Structure, Chelsea, Mass.
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WASHINGTON OBSERVER

- Delaying strategy on housing may backfire
- Legislative pace will pick up in April
- Middle Snake licensing won't be soon

● **A long delay is in prospect on housing legislation.** The House Rules Committee, the "traffic cop" that decides which legislation goes to the floor, won't clear the housing bill until after April 8. This effectively sabotages the plan of the Democratic leadership to make housing the first big test of President Eisenhower's firmness in opposing "big spending" bills.

The delaying strategy may backfire on opponents of the bill produced by Rep. Albert Rains' subcommittee. Rep. Howard W. Smith (D., Va.), ultraconservative chairman of the Rules Committee, has bottled up the bill while his forces marshal for a try to reduce its public housing, urban renewal and college loan authorizations.

The bill will pass, but President Eisenhower won't get it until late April at the earliest. Adjustment of Senate-House differences may produce a snarl that would mean even longer delay. By then FHA's mortgage insurance authority will be perilously low. In such circumstances, **the President will be under more pressure to sign.**

—

● **Airport aid moves closer to final passage.** It probably will go to the White House before Congress begins its 10-day Easter recess—March 27 to April 6. Its chances for surviving a Presidential veto seem to hinge on how Congress finally compromises between the Senate's $465-million bill and the House's smaller, $297-million measure.

The pace will pick up sharply after Easter. Committees are advancing their work the remainder of this month so a large number of important bills can be passed quickly in April and May.

TVA's self-financing program has had a friendly hearing in the House Public Works Committee.

Depressed areas legislation—with big construction features—has been approved by the Senate Banking and Currency Committee. It has a high priority spot in the leadership's plans in both House and Senate.

Extension of federal unemployment benefits is a foregone conclusion, but likely on a three-month temporary basis.

—

● **A private power license for the controversial Middle Snake River will not be considered soon by the Federal Power Commission.** First the Army Engineers must complete its Columbia River review report and submit it to Congress. That won't be until late this year.

The Board of Engineers for Rivers and Harbors, which held public hearings last week, will make its recommendations to the Chief of Engineers this summer. The Engineers will then submit the Columbia River report to federal agencies and to the basin states for their comments.

Senators from the basin states had proposed passing a Senate resolution forbidding FPC to license any Middle Snake dam in advance of the Engineers' report. FPC Chairman Kuykendall has assured them his agency will wait for the Engineers' report.

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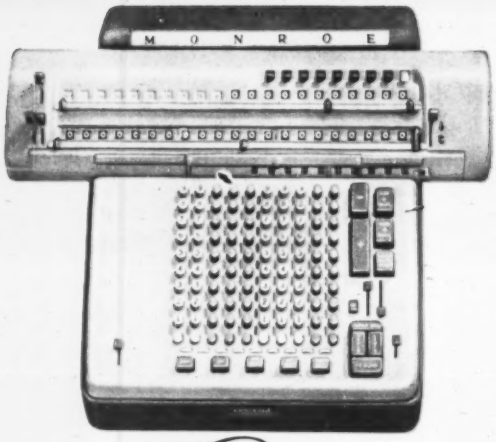

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Statehood will mean new facilities for Waikiki Bea ch and other places in booming Hawaiian Islands.

Hawaii: Good Construction Outlook

Construction men in Hawaii see nothing but good coming of statehood.

They expect statehood to attract even more U. S. attention, even more economic stimulation to the already-blooming islands.

Volume of construction activity in the territory of 580,000 people is now perking along at record levels, helping to fuel a surge of prosperity powerful enough to have soared blithely over the 1957-58 recession on the mainland.

Contracts last year came to $190 million and the 1959 figure should be nearly as high, according to the General Contractors Association of Hawaii.

Mainland firms can and do bid successfully on Hawaiian jobs. But the islands have a strong local construction industry that includes companies of all sizes and a good supply of professional engineering and architectural help.

A construction labor force of 12,500 finds steady work on 1958 contracts that include $80 million in Capehart housing, $60 million in private residential construction, $13 million in public highways, $13 million in schools and a $13-million shopping center.

This year's contracts will include big chunks of a $40-million refinery for Standard Oil of California and about the same level of highway and school construction. But there will be considerably less Capehart work—only $14 million is scheduled now.

Contractors had expected volume to taper off once the Capehart work was out of the way. Now they hope statehood will provide enough new stimulus to keep construction winging—even if not quite so high as in 1958.

The arrival of jet plane service within the next 12 months should kick off a new round of hotel building in the Waikiki tourist area.

Now Hawaii is moving ahead with a $25-million Honolulu airport improvement program and is pushing for hefty federal defense-highway allocations.

Hawaiians pay federal gas and other highway-user taxes, but the territory does not participate in the Interstate program, nor will it when it becomes a state. Hawaii is in the ABC (primary, secondary and urban) program, and statehood will bring no change there, either.

Other big projects coming include a new passenger terminal in Honolulu Harbor, dredging and filling 200 acres of offshore reefland to create a "Magic Island" for expansion of the Waikiki tourist sector and opening a number of new tourist, residential and industrial areas.

The current session of the Territorial Legislature is expected to choose a site and give the go-ahead for a new state capitol and to allocate funds for preliminary planning of "Magic Island."

• **Changes coming**—When statehood comes officially, the Territorial Public Works Department will split, peeling off its highway department into a separate state agency. That's required by the state constitution, written and ratified in 1950.

The highway department would carry through with such projects as the $54-million Honolulu Freeway, the $21-million modernization of cross-mountain highways and the completion of round-the-island highways sought for several islands.

A $1-million highway department building is already nearing completion.

Public Works would carry on with the airport modernization, a new, $60-

million terminal for Honolulu Harbor, a new capitol and development of Honolulu's extensive waterfront area.

Schoolbuilding will remain a function of the counties.

A more important result of statehood will be the addition of two Senators and a Representative from Hawaii to the Washington scene.

The representation that comes with statehood may help Hawaii get a 120-mile defense highway on Oahu Island. The total program would cost $120 million to $200 million.

• More mainland competition—The growth of Hawaiian construction work, coinciding with lean pickings in some mainland areas, has led an increasing number of mainland firms to bid on island jobs.

Five different California firms hold Capehart housing contracts; Morrison-Knudsen Co., of Boise, is part of a joint venture on an extensive irrigation project; and three other mainland firms —William Blackfield Enterprises, Foster Homes and Centex Construction Co. —are engaged in residential construction.

Mainland architectural and engineering firms also have been active in the territory.

Materials prices are higher than on the mainland because some materials must be imported (see below). But labor costs are generally lower than the mainland average—about equivalent to those in the South. Plumbers and electricians are the only fully unionized trades; they're AFL-CIO affiliates.

There seems to be plenty of business for all right now. But established local construction men are quick to point out that there's no type of work local firms can't handle.

Designs by some outsiders have sometimes had unhappy results, groused one Hawaiian engineer recently. Federal specifications applied to buildings in Hawaii have on occasion been designed for snow loads, or called for freeze-proof hydrants.

"There's some feeling that we must be backward," he complained, as he looked at a roster of choice jobs that went to mainland firms.

"I don't care if they hire an outsider for convenience or for price reasons," he said, "but there's absolutely no reason in the world to go outside on the grounds that there isn't competent service available here.

"Both the architectural and the engineering professions have very high standards here, more so than many large cities. We're on a par with any state."

• Who's in Hawaii?—There are literally thousands of contractors listed in Hawaii; 250 are on the rolls of the General Contractors Association.

Biggest is Hawaiian Dredging and Construction Co., an international concern with projects around the world. It has recently finished or is working on multimillion-dollar jobs in Kuwait, the Suez Canal, Subic Bay, Tokyo Bay and Midway. It is building the $13-million shopping center in Hawaii for one of its wholly-owned subsidiaries and is about to go to work on Conrad Hilton's 1,000-room Waikiki Hotel.

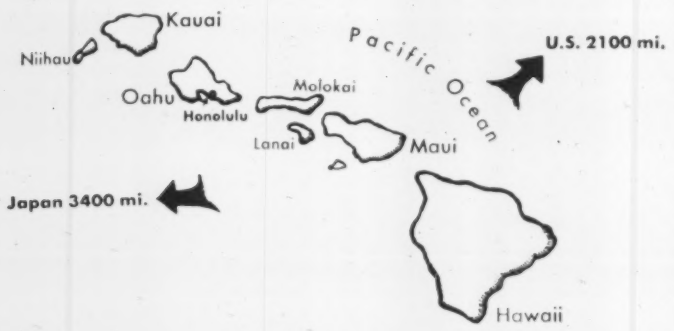
After Hawaiian Dredging comes E. E. Black Ltd., which is completing a twin-bore traffic tunnel, and has a 1,050-unit Capehart contract; Pacific Construction Co.; Walker-Moody Construction Co.; James W. Glover Ltd.; and J. M. Tanaka Inc.

Henry J. Kaiser and Fritz J. Burns are their own contractors on a tourist development, Hawaiian Village, that now has 800 rooms and will expand to 3,000.

Hawaii has some 800 or more registered professional engineers and about 100 members in the American Institute of Architects.

Active professional chapters are maintained in Hawaii by the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the Institute of Radio Engineers, the Society of American Military Engineers, the Society of Naval Architects and Marine Engineers, the American Management Association and the Society of Automotive Engineers.

Hawaii's climate is ideal for year-round building. Temperatures rarely go to extremes of hot or cold. Rainfall varies from about 20 in. per year at the beach to 100 in. in the hills.



Hawaii: Problems in Paradise

Although Hawaii is favored with a delightful climate—both physical and economic—there are two major problems facing contractors.

• Usable land is scarce.

• Most construction materials must be shipped in.

Three quarters of Hawaii's population and almost all the 100,000 military population live on the island of Oahu. Much of the Island's 600 sq mi is mountainous, with deep, inaccessible valleys.

The land shortage on Oahu limits the growth of industry and has helped bring a critical housing shortage.

"This land shortage is somewhat artificial because it is based upon tremendous holdings of land in relatively few hands," says Hawaii's Gov. William F. Quinn.

Some 88% of the total land area of the islands is controlled by the federal, territorial and county governments and 50 large private landowners, a report of the Territorial Economic Planning and Coordinating Authority shows.

There are, however, signs pointing to possible enactment of land reform legislation. In recent years convening of the legislature has almost invariably been accompanied by the cry, "Break up the big estates." Now, for the first time, the Democratic majority has appointed a Public Lands Reform Committee that will function in the Territorial Legislature

Construction costs on the islands are adversely affected by the materials problem. But improvement is in sight.

A steel plant is scheduled to open next year. It will produce reinforcing bars from scrap. And a local cement plant is a long-range project. Permanente is now the only supplier of island cement.

Hollow tile blocks are manufactured on the island, but practically all lumber is imported.

ICBM Base Building Moves Ahead

The U. S. intercontinental ballistic missile base construction program pushed forward on three fronts last week.

The Air Force selected Lincoln Air Force Base, Neb., as the site of its seventh Atlas base; a contract for construction of Atlas ICBM facilities at Francis E. Warren AFB, Wyo., was awarded; and bids for the construction of ICBM launching facilities at Offutt AFB, Neb., were opened.

Funds for construction of Atlas installations at Lincoln AFB are being requested in the upcoming federal budget. Work on the project is expected to begin late this year.

Construction of the Lincoln AFB launching sites will give the Air Force five Atlas bases.

The Corps of Engineers last week awarded to Blount Construction Co., Montgomery, Ala., a contract for the construction of three Atlas ICBM launching sites near Warren AFB.

Blount's low bid for the project was $12,422,104.

The work calls for launching buildings for three Atlas ICBMs at each of three sites located from 16 to 20 miles northeast, southeast and southwest of Cheyenne.

Construction is well advanced at another site 20 miles northwest of the city, where six of the missiles will be based.

The Atlas will be ready for use this summer (ENR Jan. 29, p. 30). Warren AFB will go into partial use as an Atlas base next year.

In addition to three launching buildings, each site will include an operations building, a power and pump house, three generators and utilities.

Fourteen companies submitted bids for the projects. The government estimate was $14,373,830.

Blount submitted bids of $5,533,865, $5,465,191 and $5,503,148 for construction of the individual sites.

George A. Fuller Construction Co., Los Angeles, was low bidder on two of the sites at $4,459,637 and $4,497,137. The Malan Construction Co., New York City, was low with a bid of $4,447,728 on the third site. But the total of the low individual site bids was far above Blount's package bid.

Although outbid on the Warren AFB job, Malan Construction Co. is the apparent low bidder for construction of three Atlas launching facilities for Offutt AFB, Neb.

Malan's bid of $12,870,000 was only about 0.03% under the second lowest bid. The next low was the $12,874,596.45 submitted jointly by MacDonald Construction Co., St. Louis, C. H. Leavell & Co., El Paso, and Scott Co., Oakland, Calif.

The third low bid was $12,931,070.82, made by Peter Kiewit Sons' Co., Omaha. The government estimate for the project was $13,113,343.01.

The number of bids—16—and the tightness of the bidding were evidence of the contracting industry's interest in entering this new field.

More than 300 persons were on hand at the opening of bids. This was the largest crowd in the history of the Corps of Engineers' Omaha District.

The Offutt AFB launching sites will be near Mead, Neb., Arlington, Neb., and Missouri Valley, Iowa.

Each site will include three launching buildings, a launch operations building, a power plant and pumping building and utilities. Three Atlas ICBM's will arm each site.

Problems Plague Ellis Island Plans

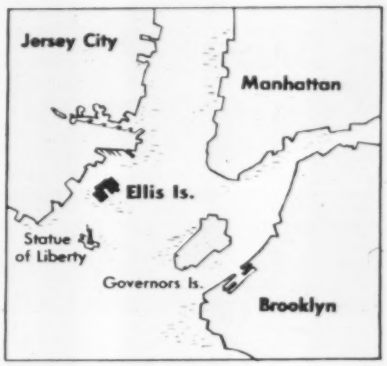
Ellis Island, the government's former immigration center in Upper New York Bay, may become a pleasure resort and cultural center.

That's the plan of developer Sol G. Atlas, whose $671,000 bid was the highest of 24 received by the government. Other plans submitted for the 27½-acre island include an oil storage center and luxury apartment building development.

The island was on the block once before, in February 1958. Mr. Atlas was high bidder then at $201,000. But the General Services Administration rejected it as too low. GSA says the government's total investment is $6.3 million. The U. S. bought the island from New York State in 1808 for $10,000.

If his latest bid is accepted, Mr. Atlas expects to invest about $55 million to develop the site, which he will rechristen "Pleasure Island." Facilities would include a 600-room hotel, marina, music shell, tennis courts, swimming pools, skating rinks, a museum and a language school.

Some major problems confront any new owner. Most of the bidders consider the 35 buildings on the island worthless. These include dormitories, offices, powerhouse, hospital and recreation facilities. All would have to be razed.



The island is so infested with rodents and insects that the ground itself would require treatment before new construction could begin, Mr. Atlas says.

Mr. Atlas also doubts that New York City would accept dedication of the streets. The eventual owner of the island might even have to provide all services—fire and police protection, sewage facilities, lighting and power, garbage and trash collection. Water, electric power and sewage disposal facilities are now on the island but the latter two are considered inadequate.

Transportation to the island could also be a problem. A ferry boat, which goes with the island, now serves as transportation. Plans of bidders include leasing this service to one of the excursion boat lines in Manhattan. One bidder says he would construct a cable car from Manhattan to Ellis Island.

A private owner could also find himself involved in a territorial dispute. New York says the island comes under its jurisdiction. But maps show it to be in New Jersey. It is one-half mile to the Jersey shore, and over a mile from the tip of New York City's Manhattan Island. Under private ownership, with tax revenue involved, an interstate squabble could develop.

Other bidders for the site are:

- Empire State Building Corp., New York City, $505,000.
- Development Corp. of America, Brick Township, N. J., $303,000.
- The Duraplast Products Corp., New York City, $306,000.
- Shotmeyer Brothers Co., Hawthorne, N. J., $151,000.

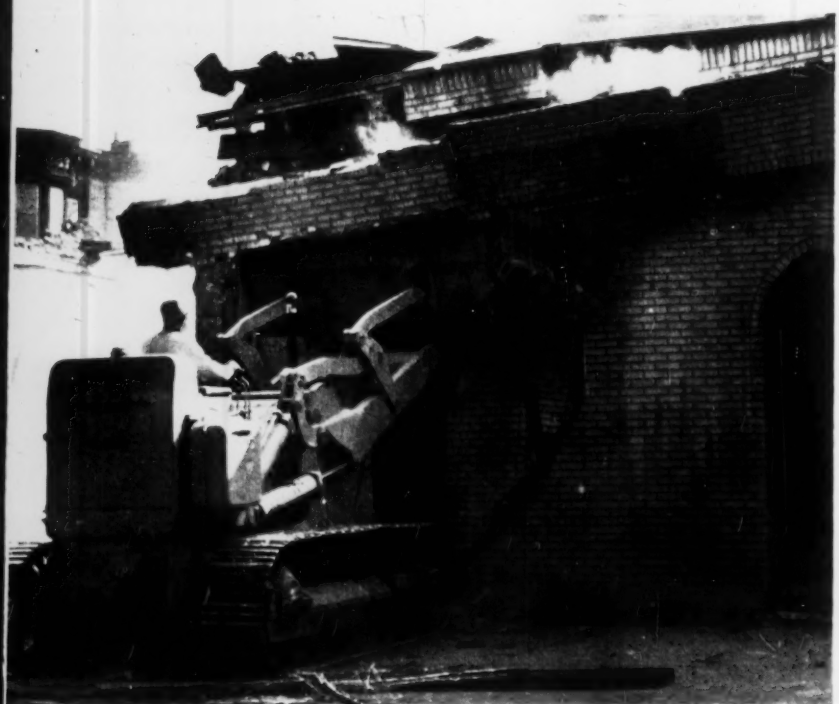
Empire State Building Corp. and Development Corp. both propose apartment building development.

Shotmeyer says it would invest $16 million in oil storage facilities.

Surplus tank rams through wall of Trenton, N. J. building . . .

. . . and quickly wrecks it for

Here Are Two Ways to Knock



More usual equipment works less well in Brooklyn when . . .

. . . operator comes too close,

Contractor V. Ottilio & Sons.

The Paterson, N. J., firm has five tanks for demolition.

Down Old Buildings

brings beam down on himself.

It takes a crane and a police squad to free the injured man.

Big 'A' Is Bridge's Only Tower

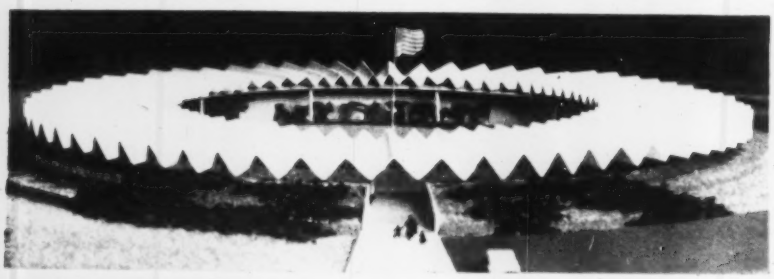
This single tower will support the suspension bridge now under construction over the Rhine River at Cologne, Germany.

The 200-ft-high "A" is not being built at midstream; cables to be strung over its top will help support a 990-ft span on one side, a 500-ft span on the other. Bridge will seem asymmetrical.

It's called a "counterpoint" design (ENR July 26, 1956, p. 23).

The 75-ft roadway will be 2,300 ft long and will clear the river by 30 ft. It's being built on falsework.

Heavy river traffic made the one-pier design ideal.



Down-to-Earth School Building?

This model was designed by San Francisco architect Albert E. Sigal as combination school and fallout shelter. Cost: about 50% above average. It's the result of a year-long study by nuclear energy committee of the North California Chapter of AIA. All classrooms are underground.

Cowlitz in Trouble

Oft-blocked Tacoma power project hit by an initiative

Tacoma City Light's controversial Cowlitz River hydro project is facing another big hurdle.

An initiative prohibiting construction of dams more than 25 ft high on any Columbia tributary below McNary Dam has been certified to the Washington State legislature. Introduction of the measure in the legislature becomes automatic now that the required number of signatures on a supporting petition has been proved valid.

If the legislature votes the bill down or fails to act on it, the initiative automatically goes before the voters in the fall of 1960.

If the measure passes, Tacoma City Light's two dams are in for indefinite delays or even abandonment. The dams are Mayfield, a 185-ft-high dam already started, and the proposed 350-ft-high Mossyrock Dam.

Tacoma has indicated it will appeal to the courts if the bill is passed.

Tacoma City Light feels the initiative will be ineffective legally. The U. S. Supreme Court has ruled that the city agency may proceed with the project despite state laws to the contrary (ENR June 26, 1958, p. 19).

The Washington State Sportsmen's Council, which solicited the signatures for the petition and is one of the most persistent objectors to TCL's plan for the dams on the Cowlitz, contends the initiative not only could keep TCL from building the dams but also could prevent it from selling its rights to another utility.

Despite these complications, Tacoma may complete Mayfield Dam (ENR April 18, 1957, p. 29). City officials believe the initial bond issue could be held to $10 million and hope the matter could be cleared up before additional funds were needed. However, the city has been told to expect to pay a premium in interest rates on the bonds as long as the initiative is pending.

Under the terms of its amended Federal Power Commission license, Tacoma must resume work on the two-dam, 460,000 kw project by July 1 and complete it within three years.

TCL has already spent $11 million on Mayfield. Rather than award a single contract for completion of the dam, the city may award a contract for completing the excavation, costing an estimated $175,000. Bids for the four 55,000 kw turbines may be called ahead of bids for completion of the dam.

Delivery of the turbines will require 15 months while the dam could be completed in 10 months.

Canada Works on Its Two Fallen Bridges

Demolition men are blasting and burning out two reinforced-concrete towers for the new Second Narrows Bridge at Vancouver, B. C. The towers were pulled out of plumb last year when two spans collapsed during construction, killing 18 men (ENR June 26, 1958, p. 21).

Small charges are used to blast away 2,000 cu yd of concrete a little at a time. Between blasts, acetylene torches are used to cut out the reinforcing steel.

The concrete base of the pier, set on 800 wooden piles, will probably stay. Engineers are making diamond drill tests on the base to make sure there is no internal cracking.

Tower demolition is being done by Northern Construction Co. and J. W. Stewart, Ltd. Dominion Bridge Co. is continuing to work on erection of the unaffected southern spans for the bridge.

Anticipated cost of the six-lane bridge is now $20 million; original estimate was $16 million.

Construction is under way on a $6-million, six-span, deck truss bridge to replace the Peace River Bridge that collapsed near Taylor, British Columbia in 1957 (ENR Oct. 24, 1957, p. 26).

Two Vancouver companies—Vancouver Pile Driving & Contracting Co. Ltd. and Manning Construction Co. Ltd.—have a joint $1.2-million contract for the substructure. Crews have been working during the winter and should be finished by mid-April.

The Pacific Division of Dominion Bridge Co. Ltd., Vancouver, has a $2.7-million contract for fabrication and erection of the steel superstructure and supply and installation of steel decking.

Other expenses go principally for demolition of the old bridge.

The new span is scheduled for completion by November 15. It will be 2,336 ft long and 35 ft wide. There will be two 13½-ft traffic lanes and two 4-ft sidewalks.

The original Peace River Bridge was a suspension span. It caved in when its north anchorage block slid forward on a shale base. The north approach of the new bridge will have a 552-ft span that will extend the bridge well over the slide area of the river bank.

The surface of the bridge will be a patented, open-mesh decking that will permit ice and snow to drop through. No major changes are planned for the access roads.

Traffic in the area has been routed over the Pacific Great Eastern Railway bridge since the collapse.

In US, Bridge Plans Start and Falter

Delaware and New Jersey plan a $100-million mate to the Delaware Memorial Bridge across the Delaware River.

The new span may be less than 1,000 ft from Memorial Bridge.

Target date for completion is 1965.

Memorial Bridge is four lanes—too narrow for an expected onslaught of traffic generated by big highway projects recently completed or under construction in both states.

Present thinking is for one bridge to carry eastbound traffic; the other, westbound.

Representatives of both states met last week and agreed to write a compact for creation of a bi-state authority to be known as the Delaware River and Bay Authority.

The compact must be ratified by both state legislatures and the U. S. government. It's hoped that the authority can be formed by the end of the year.

New York State Bridge Authority will let contracts in May for the substructure of the proposed $40-million Newburgh-Beacon Bridge across the Hudson River.

The authority expects the bridge to be completed by mid-1962.

Some $24 million of New York's share of federal Interstate Highway funds will help to finance the construction. The authority's share will come from a $14-million bond issue and $2 million in funds on hand.

In conformance with federal law, the bridge will become toll-free after payment of its bonds. It will then be operated by the State Department of Public Works.

The authority was established by the state legislature in 1952 to build and operate all Hudson River crossings between New York City and Albany.

The authority has built the Rip Van Winkle Bridge and the Kingston-Rhinecliff Bridge. It acquired the Mid-Hudson Bridge from the state and bought Bear Mountain Bridge from private owners. It has operated the Newburgh-Beacon Ferry since 1956.

The authority has five appointed commissioners and a staff of 159.

Possibility of slim revenues may rule out the construction of two toll bridges in North Carolina with a total estimated cost of $23.6 million.

The largest structure, across the Cape Fear River at Wilmington, would cost an estimated $16.2 million. The second, across the Alligator River in Tyrell County, would cost $7.4 million.

According to a financial feasibility study by Parsons, Brinckerhoff, Hall & Macdonald, New York City consulting engineers, toll revenues earned by the bridges would be much less than required to cover cost of operation, bond interest and bond retirement.

The Cape Fear River crossing would be 135 ft high to permit passage of ships into the harbor at Wilmington. The one across Alligator River would be three miles long and have a movable span to permit passage of boats.

Melville Broughton, chairman of the state's highway commission, says, however, that the results of the study do not "preclude in any way, further consideration by the highway commission of the two bridges."

Bethlehem Steel Co. was the low-bidder on its own design for fabrication and steel erection on a new Pennsylvania bridge. It designed a steel alternate for a structure that had been planned in prestressed concrete.

The new bridge will span Brodhead Creek between Stroudsburg and East Stroudsburg, Pa.

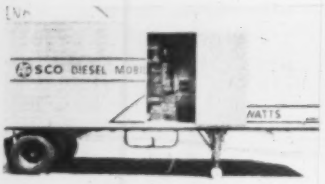
It will replace a temporary bridge that has connected the two towns since the 1958 floods washed away a two-lane, two-span truss bridge.

The proposed bridge was originally designed in prestressed concrete and advertised for bids with a clause permitting the contractors to bid on a steel design of their own. Bethlehem designed a bridge that will have the same general appearance, profile, dimensions and load-bearing characteristics as the concrete design and was awarded the contract for the structural steel on a low-bid basis. About 630 tons of fabricated structural steel will be involved.

J. Richard Nissley, Inc., is the general contractor for the bridge.

The bridge will have a main span 150 ft long and two side spans, each 120 ft long. It will carry two 25-ft roadways, each two lanes wide, as separate bridges on common piers. Each roadway will have nine-inch curbs and an outside sidewalk 6 ft 9 in. wide, with a steel railing surmounting a parapet.

Diesel-Electric Power plant on wheels



300kw power at any standard voltage for operations in remote areas and as stand-by power is now available through a new diesel-electric power plant on wheels. Constructed as a full trailer unit, the plant contains a General Motors 450hp model 8-268A diesel engine and a Westinghouse 300 kw, 375kva electric generator complete with switchgear and radiator. Plants are available for immediate delivery and are ready to operate on arrival.

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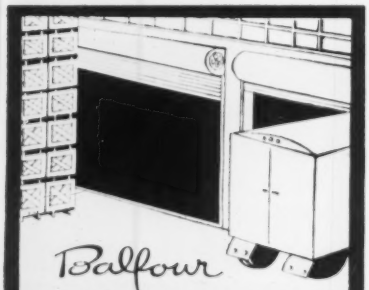

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Prescription for Sick Railroads

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- Adequate relief from local and federal taxes;
- Modernization of antiquated facilities;
- More realistic allowance for equipment depreciation;
- And a bold approach to cutting costs and streamlining operations.

That was the order served up by speakers before the American Railway Engineering Association, meeting in Chicago last week.

It's a big order. But leaders in the industry, such as Daniel P. Loomis, president of the Association of American Railroads, say it can be met. Many traditions may have to go by the board in the process.

Mr. Loomis told AREA a new spirit is taking hold of railroading: "We are cutting out the deadwood of losing and unpatronized services and concentrating effort and resources in areas of greatest promise."

• More research needed On the technical side, speakers stressed the need for continued research.

Methods and materials of railroad construction, operation and maintenance must be improved, they agreed. B. R. Meyers, vice president and chief engineer of the Chicago and North Western Railway Co., noted that AAR spent $550,000 on research last year. The need for expanding research today is just as important as it was a year ago (ENR Mar. 20, 1958, p. 22), he noted.

"An accelerated research program now could well be the key to the railroads remaining in a competitive position with other forms of transportation," Mr. Loomis said.

Other speakers outlined additional critical needs of the railroad industry. Among the needs: attracting young college graduates and development of nuclear-powered trains.

Railroads admit they have vast backlogs of improvement projects on their drawing boards that offer great potentials in better service at lower costs. Despite the lack of current funds, some means must be found to implement and expedite them, they say.

Frank R. Woolford, chief engineer, Western Pacific Railroad Co., was elected president of AREA, succeeding B. R. Meyers.

Chicago OK's Zimmerman Plant

Chicago is going to build a 300-ton-a-day Zimmermann Process sludge-disposal plant on the strength of a pilot study made last year. The plant will be built at the West Southwest Sewage Treatment Works, where the new wet-oxidation process for sewage sludge was tried out for a year in a two-ton-a-day pilot plant (ENR Nov. 27, 1958, p. 44).

The Metropolitan Sanitary District's board of trustees has also authorized design and construction of a 250-ton-a-day, conventional, heated, sludge-digestion plant at the West Southwest Works and a similar plant for 75 tons of sludge a day at the Calumet Works.

No estimates are available on the cost of the installations, nor has a construction timetable been completed. However, sanitary district engineers hope to complete the plans in about three months.

The additional facilities are expected to be put into partial operation within two years, although the entire installation will probably require at least three years.

The Zimmermann plant will consist of six 50-ton-a-day units.

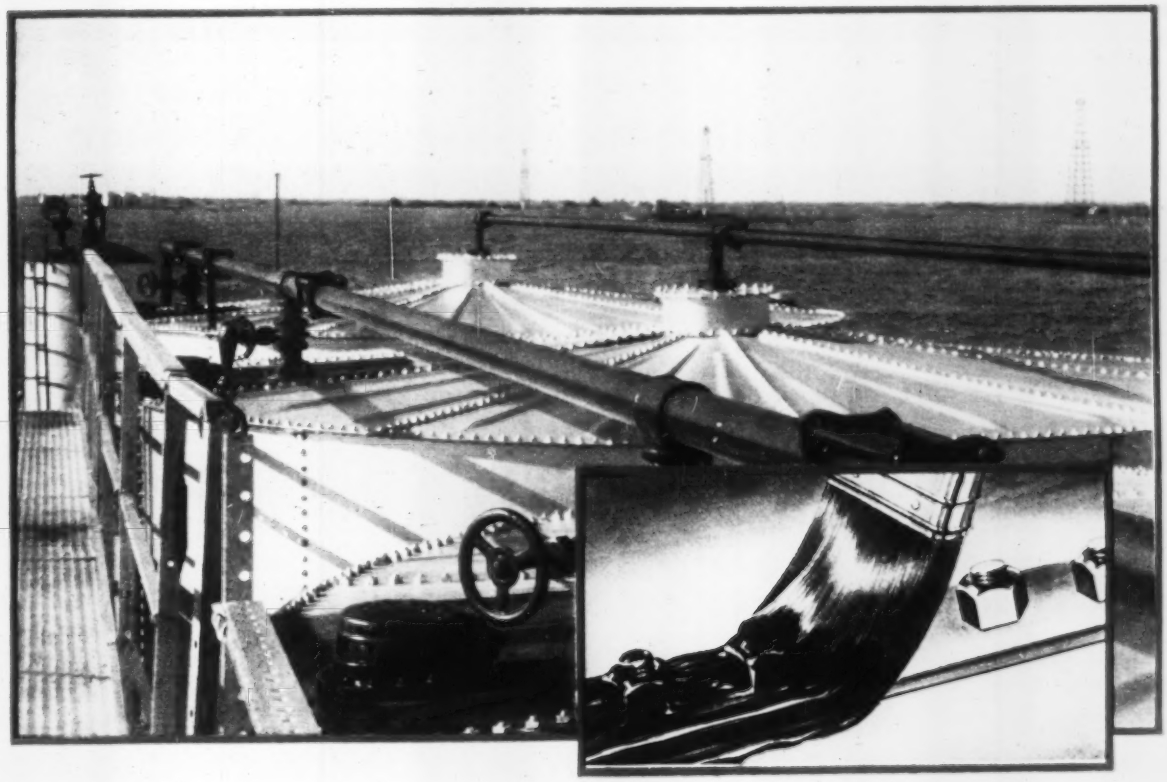
The sanitary district has been faced with an increasing problem of sludge disposal for some time. The present dependable sludge-disposal capacity at the West Southwest Works is about 650 tons per day, exclusive of the use of several sludge lagoons.

Studies made in the district's engineering department in 1956 indicated that by 1970 from 780 to 800 tons per day of sewage solids would have to be disposed of. This calls for a total sludge-disposal capacity of 960 tons per day. Since that study, the district has been enlarged to its present 900 sq mi of metropolitan area.

Another study made in 1958 by Greeley and Hansen, Chicago consulting engineers, covered the needs of the enlarged area. It indicated that an annual average disposal capacity of 865 tons per day of sewage solids would be needed by 1970. This means a plant capacity of 1,047 tons per day. That same study indicated a need for plant capacity of 1,156 tons per day by 1980, and 1,200 tons per day by 1985.

Based on these studies, engineers of the sanitary district recommend adding 550 tons per day of sludge-disposal capacity at the West Southwest Works, which should be adequate for the next 25 years.

The West Southwest Treatment Works handles more than 90% of all the district's sludge. The facilities will eliminate all lagooning of raw sludge.



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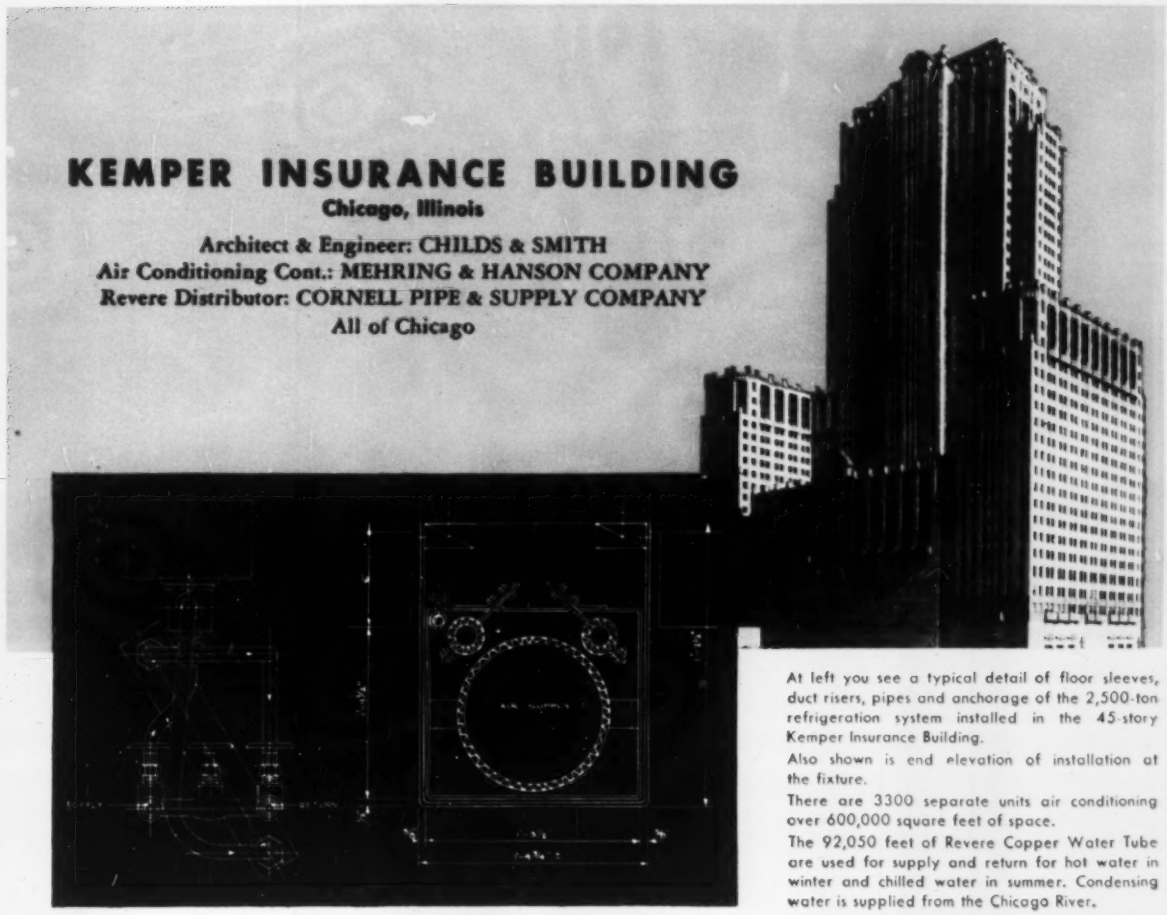

At left you see a typical detail of floor sleeves, duct risers, pipes and anchorage of the 2,500-ton refrigeration system installed in the 45-story Kemper Insurance Building.

Also shown is end elevation of installation at the fixture.

There are 3300 separate units air conditioning over 600,000 square feet of space.

The 92,050 feet of Revere Copper Water Tube are used for supply and return for hot water in winter and chilled water in summer. Condensing water is supplied from the Chicago River.

"In fact, because of the nature of the job, the Revere Copper Water Tube we used cost *much* less to install than if rustable pipe had been used," continued Mr. McClellan.

"We used 88,050 feet of type K tube for the risers, in sizes ranging from $\frac{3}{8}$" to 6", and 4,000 feet type L tube in smaller sizes for connecting at the fixtures. Add to this 3,300 separate air conditioning units and you can readily see that making all those connections with threaded pipe would have been a much more time-consuming and costly proposition than the soldering of copper tube.

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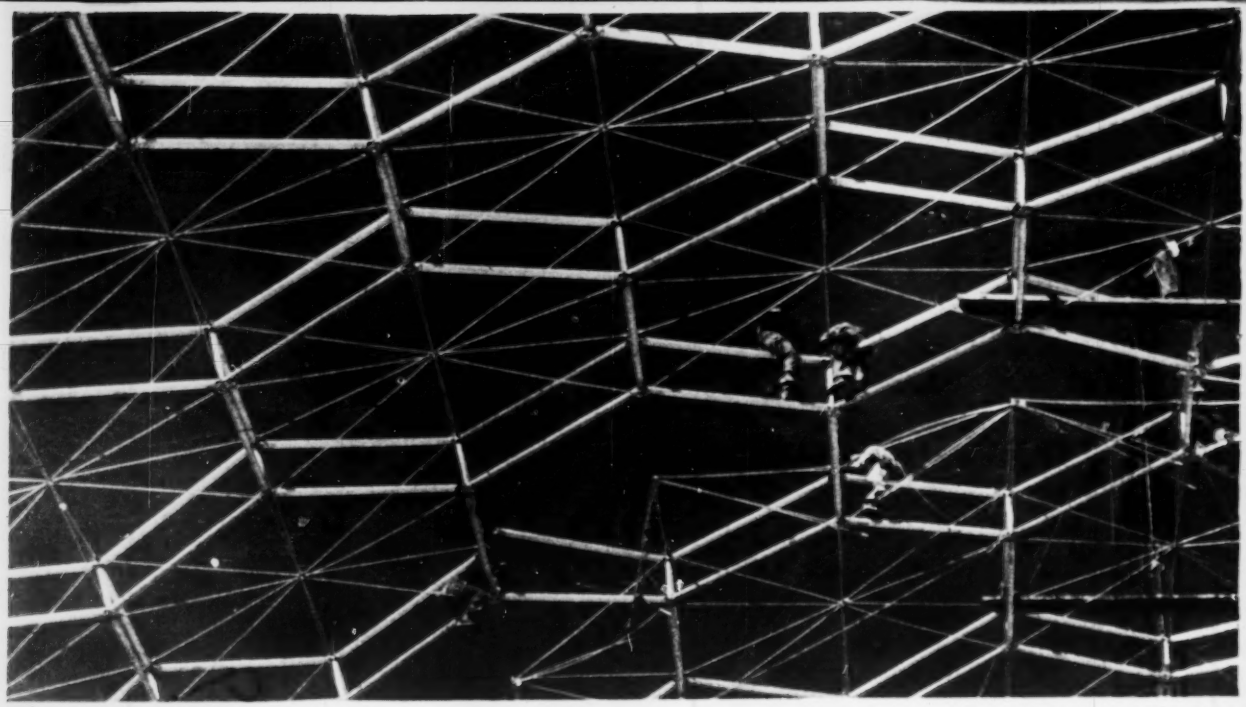
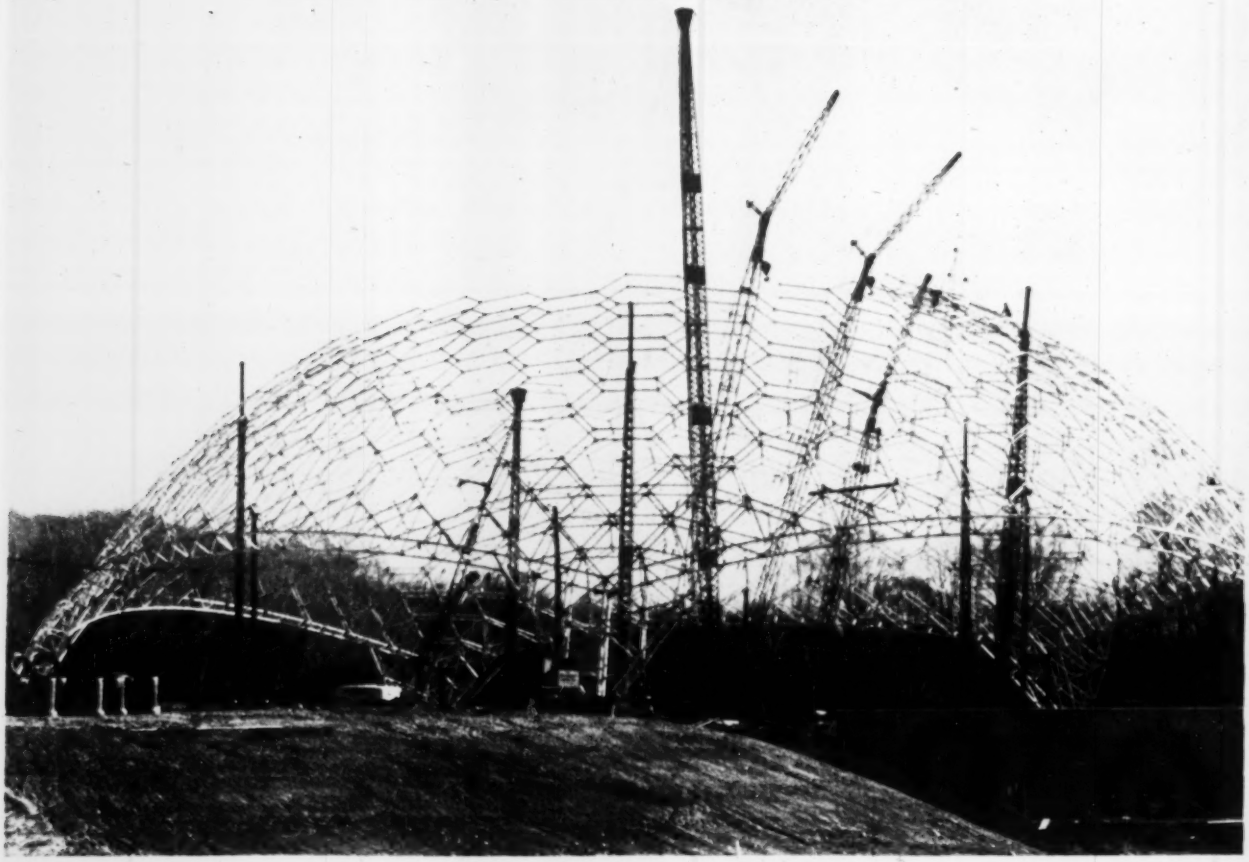
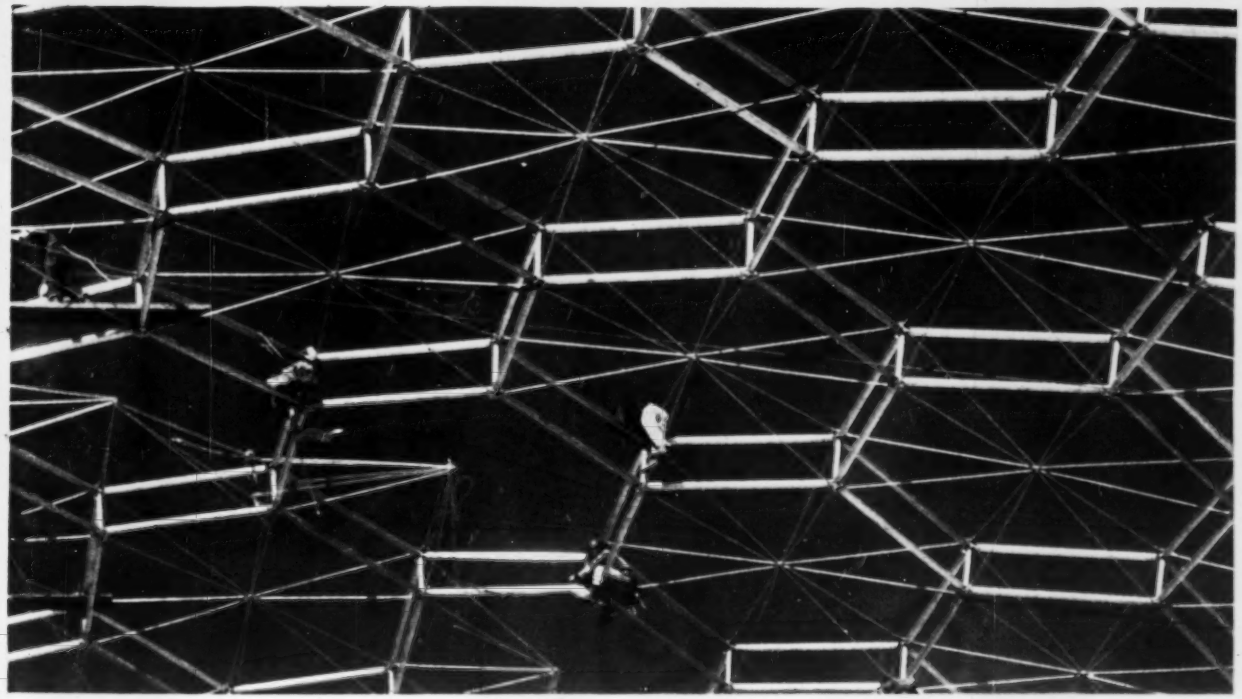


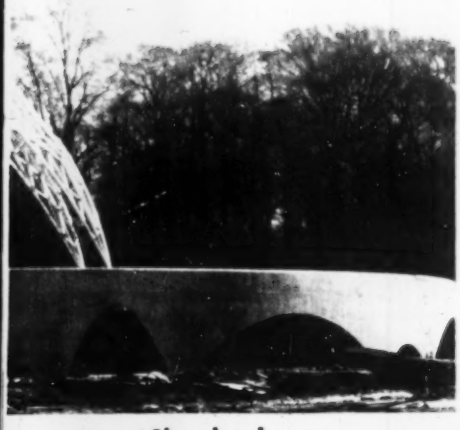
Weaving 65,000 Aluminum Tubes



Open frame dome takes shape over the site of American Society for Metals' new headquarters



Into Lace for a Double Dome



near Cleveland.

One of the world's largest metal framed domes will form a canopy over the buildings and grounds of the American Society for Metals' new headquarters near Cleveland.

It was conceived as an example of man's conquest of metals. The all-aluminum spherical dome is 250 ft in diameter and stands 103 ft high at the center. When the final section was lifted into place, the structure contained more than 65,000 pieces of prefabricated aluminum tubing.

Basic construction unit is a two-level hexagon about 11 ft across, with the two levels separated 30 in. The hexagonal units were assembled on the ground, joined in groups of 8, 10 or 12 and hoisted into position.

While construction was in progress, these sections were supported by temporary steel columns, or by cables suspended from crane booms.

The final lift, a 50-ft section that completed the dome top, required less than 45 minutes to place after the section was hooked up for the lift. This section was assembled around a 150-ft gin pole, which then lifted it into place.

The dome covers about 50,000 sq ft and costs $5 per sq ft. It has 5¼ miles of 4- and 6-in. tubing and 7½ miles of tension rods. The tubing and the rods together weigh nearly 200,000 lb.

The dome stands on five concrete pylons that rest on pile foundations driven 70 ft into the ground. An underground tension ring connects the five pylons to prevent lateral movement.

Erection of the first tier of pylon-to-pylon truss took 14 hours. But so great was progress in construction technique that the last tier was finished in just 90 minutes. The entire dome took ten weeks to erect.

With the dome completed, construction has begun on a three-level, semi-circular office building. Sections of the headquarters will extend under three of the domes' arched openings at the base. The openings are 50 ft high. Occupancy is expected late this summer.

Grounds of the new headquarters, mostly under the dome, will consist of a circular piazza. It will feature a sunken mineral garden displaying native ores and unusual minerals.

The dome was erected by the Mak Construction Co. of Cleveland. Gillmore-Olson & Co. were the general contractors. The aluminum tubing was produced by Kaiser Aluminum & Chemical Corp. North American Aviation, Inc., fabricated the material. John E. Kelly of Cleveland is the architect. R. Buckminster Fuller (Geodesics Inc., Cambridge, Mass.) designed the dome.

The dome is mainly decorative, but it has opened up some challenging possibilities for more functional buildings in the future, according to Alan Gillmore, Jr., vice president of Gillmore-Olson.

"Geodesic principles could make possible a new general type of construction that would provide greater clear space areas at lower cost than was ever possible before," Mr. Gilmore says.

Engineers Offer Earthquake Code

- **Uniform California code emphasizes frame type and building frequency, favors some frame systems, docks others.**
- **Code provides specific design recommendations wherever possible, and indicates areas needing more study and research.**

William T. Wheeler
Structural Engineer
Los Angeles

A new type of earthquake hit California last year.

This "earthquake" was no freak of nature; it was a code planned by structural engineers to benefit the public.

For the first time the structural engineering profession in the state agreed on uniform lateral-force requirements to be recommended for adoption by all building enforcement agencies. The profession considers its recommendations a major step forward in the application of scientific studies and research.

The code is the work of the Structural Engineers Association of California. It has been adopted formally by that group subject to review and final ratification later this year. The provisions will probably be adopted by the International Conference of Building Officials for use in their Uniform Building Code.

• **New base shear formula**—The code includes a new base shear formula that introduces two variables.

One directly introduces the fundamental period of the building or structure and defines a method of determining the period where it cannot be accurately predetermined.

The second variable is dependent on the type of structural system used. Certain types of construction get bonus consideration by assignment of lower seismic factors. Others are penalized. For buildings with the same fundamental period of vibration, the total seismic force can vary by a ratio of two to one.

The construction type is covered by a factor K (see p. 59). This as well as other aspects of the new code have required definitions.

The fundamental period of the building is included in a second factor C.

Each structure must withstand a total lateral seismic force V (also called base shear) acting independently in the direction of each of the main axes. Thus, the base shear formula is:

$$V = KCW$$

In this case W is the total dead load. However, in storage or warehouse occupancy W is dead load plus 25% of the floor live load.

The C factor is a numerical coefficient determined by the formula:

$$C = \frac{0.05}{\sqrt[3]{T}}$$

In this case T is the fundamental period of vibration of the structure in the direction considered.

But there are many instances where adequate technical data are lacking for establishing T. So the code includes the following formula:

$$T = \frac{0.05\,H}{\sqrt{D}}$$

Here H is the height of main portion of building in feet and D is the plan dimension in feet of the building in a direction parallel to the applied forces. However, where the building has a space frame that resists 100% of the required lateral forces, T is 0.10 times the number of stories. In no case is T assumed to be less than 0.10 seconds.

One and two-story buildings are placed in a special category with a conservative C value of 0.10 assigned. But appropriate K factors still apply. Buildings in this height range are normally box-type structures and include many commercial, industrial and public school buildings. C is assigned a value in these cases because present knowledge does not permit accurate analysis for period determination of this type of structure.

All K coefficients noted in the table are intended for use in the State of California and other areas of similar earthquake activity. For areas of different activity the coefficients will require modification.

The foregoing applies only to buildings. Other types of structures are also referred to in the code. And the code has some special consideration of building parts like towers, chimneys, and parapet walls.

• **Distribution of force**—In general, the code calls for the total lateral force V to be distributed in a triangular pattern. This formula is followed:

$$F_x = \frac{V w_x h_x}{\Sigma\, wh}$$

Here F_x is the lateral force applied to a level designated as x, w_x is that portion of the dead load W that is tributary to the level designated as x, h_x is the height in feet from the base to the level designated as x and Σwh is the summation of the products of all $w_x h_x$ for the building. At each level designated as x, the force F_x is applied over the area of the building in accordance with mass distribution on that level.

Exceptions to the triangular distribution include one- or two-story buildings where distribution is uniform, and buildings with a large height-to-depth ratio for any lateral-force-resisting system. In this latter case, where the height-to-depth ratio of the lateral force resisting system is equal to or greater than five to one, 10% of the total force, V, is considered as concentrated at the top story. The remaining 90% is distributed as provided for in the above formula. This provides for a greater concentration of shear in the top stories.

• **Torsion in buildings**—The new code still includes provisions for horizontal torsion are due to any eccentricity between the center of mass and center of rigidity. However, many buildings or structures can be planned so the centers of mass and rigidity coincide. But there is still lack of any resistance to "accidental" or other indeterminable torsional moments. The new code provides that in all cases the shear-resisting elements at each floor level shall be capable of resisting, in addition to the translation seismic forces, a torsional moment assumed to be equivalent to the story shear acting with an eccentricity of not less than 5% of the maximum building dimension at that level.

Provisions remain in the code to design all structures to resist the overturning effects caused by the application of wind or earthquake forces. However, an additional provision is included in the new code to permit a reduction in the axial loads from earthquake forces

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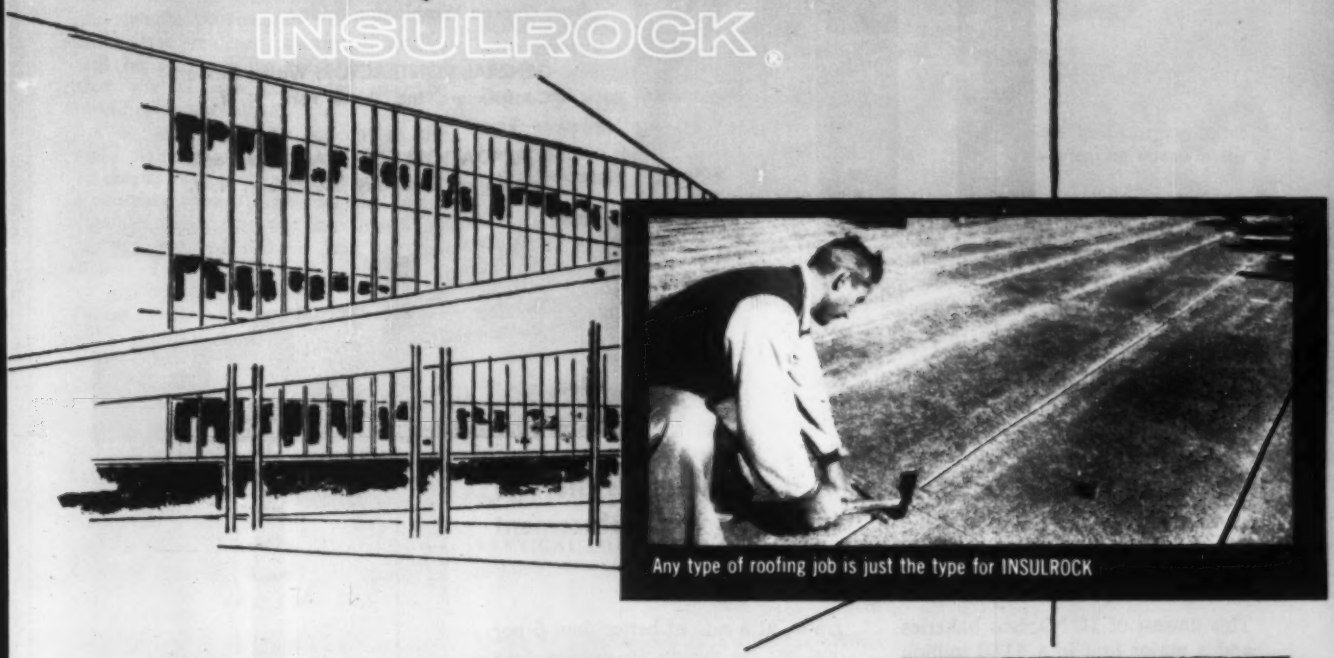


Any type of roofing job is just the type for INSULROCK

INSULROCK ceilings don't even need finishing.

This saving on ceilings is one of the building economies to expect with INSULROCK.

You get it because the underside of the INSULROCK used topside as roof decking furnishes — without further finishing — a good-looking, off-white acoustical ceiling whose honeycombed noise-trap construction absorbs 80% of incident sound. Your INSULROCK exposed ceiling gives light reflectance of 60-70%, makes the most of your light source, helps prevent eye strain.

You always get other outstanding INSULROCK economies, too:

Strength, because rugged, tough INSULROCK roofing slabs are enduringly bonded with portland cement. The exposed-ceiling surface is treated with an indurating, abrasion-resisting "cementitious" coating;

Easy Installation, because INSULROCK—for steel joist, wood joist, or bulb-tee con-constructions — lays down fast;

Building Efficiency, because air-pocketed, UL-listed, incombustible INSULROCK gives high thermal insulation, reduces air-conditioning costs.

Weather-Resistance, because INSULROCK "seasons" and "weather-cures", by being stored outside after manufacture, so you have no weather worries when your INSULROCK roof decking is "out to the weather" while being laid, or when you use INSULROCK as ceiling for outside overhangs, etc.

Let INSULROCK prove what **you'll** save.

Acoustical, light-reflecting ceilings cost nothing extra with INSULROCK.

Manufacturers of
America's Broadest line
of Building Products

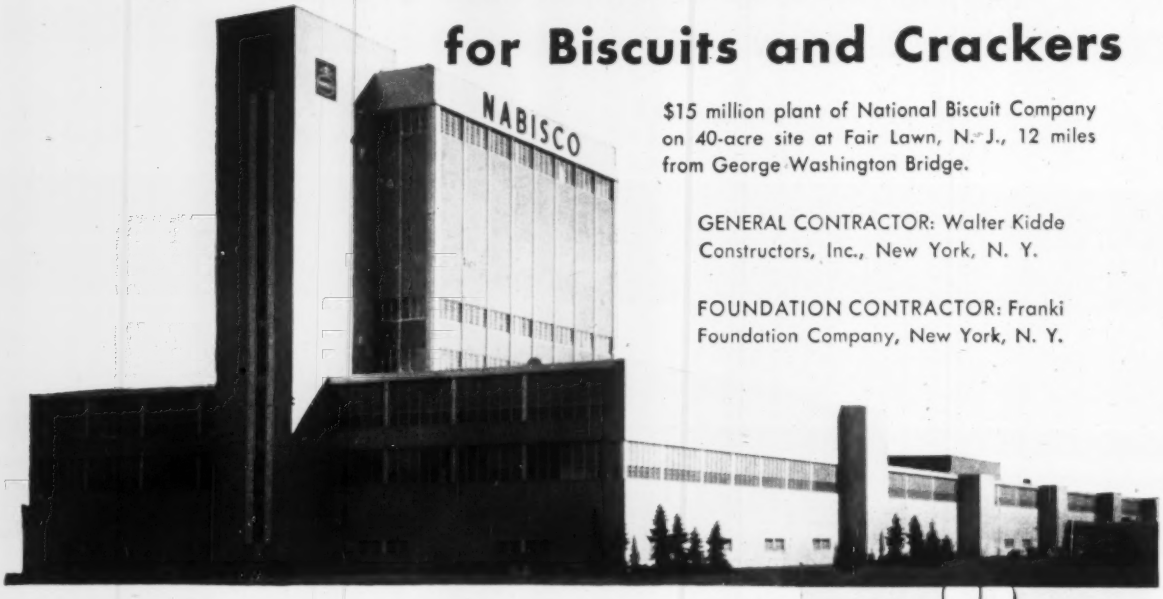
FLINTKOTE

INSULROCK COMPANY
Division of The Flintkote Company
Flintkote Insulrock distributors in principal cities

Sales Offices: 30 Rockefeller Plaza, New York 20, N. Y.—Chicago Heights, Illinois, SKyline 4-4772—Los Angeles 54, California, LUdlow 3-3011
Plants: Linden, New Jersey; Richmond, Virginia; North Judson, Indiana

FRANKI FOUNDATIONS

at World's Most Modern Bakery for Biscuits and Crackers



$15 million plant of National Biscuit Company on 40-acre site at Fair Lawn, N. J., 12 miles from George Washington Bridge.

GENERAL CONTRACTOR: Walter Kidde Constructors, Inc., New York, N. Y.

FOUNDATION CONTRACTOR: Franki Foundation Company, New York, N. Y.

164-Foot High Tower Section for Raw Materials Storage and also 2-Story Laboratory Built on Franki Displacement Caissons Bearing in Granular Subsoil.

This newest of 10 Nabisco bakeries and a major unit in a $180 million expansion and modernization program was designed and its construction supervised by the Company's own engineering department.

When borings for the tower section at the north end of the plant showed granular subsoil, Nabisco engineers recognized that displacement caissons with expanded base footings would provide a solid and most economical foundation. The tower is primarily for storage of 75 carloads of raw materials with mixing departments in the lower area.

After Franki engineers completed additional soil tests, two rigs installed 407 Franki Displacement Caissons at depths averaging 20 feet below grade, at a rate of better than 6 per day per rig during 36 driving days of cold December and January weather. Groups of caissons carry column loads as high as 940 tons.

Later, Franki engineers were called in again, this time for the foundations for an adjoining two-story Research and Development Laboratory at the south end of the four-block long bakery. A single rig installed 130 Franki Displacement Caissons in 20 driving days at average driven depths of 21 feet.

These two Nabisco installations, like other Franki work, were quoted on a lump sum basis without qualification or payment for excess footage. All work was guaranteed.

Consult Franki engineers on your foundation problems.

Advantages of Franki Methods

A Franki Displacement Caisson, with its surrounding compacted earth mass, exploits the maximum bearing capacity of the soil.

Every Franki pressure-injected-type footing of "dry"* concrete is "forged" with 140,000 foot-pound blows of a falling ram, a force many times greater than the blow of a steam or pneumatic hammer.

As a result, the advantages are:

1. High unit load capacity due to expanded base made in granular soil.
2. Economy because fewer Franki caissons of shorter length are required.
3. Volume of reinforced concrete caps is reduced to a minimum with corresponding savings in cap excavation, sheeting, reinforcing, forms and backfill.
4. Concreting of shaft can be made at any cutoff elevation below grade. Installation can be made in advance of general excavation with resulting saving in sheeting, bracing and maintenance. Depending on water table elevation, economies in pumping costs may also result.

*"Dry" concrete is defined as zero slump concrete using approximately 3½ gallons of water per bag of cement.

FRANKI FOUNDATION COMPANY

Displacement Caissons · Pressure Injected Footings · Tube Piles · Underpinning · Soil Investigations

103 Park Avenue
NEW YORK 17, N. Y.
MUrray Hill 5-8916

114 South Warren Street
SYRACUSE 2, N. Y.
HArrison 2-0478

Statler Building
BOSTON 16, MASS
HAncock 6-0010

(Continued from p. 56)

on vertical elements and footings. This modification was adapted from a method outlined in a paper by John E. Rinne entitled "Earthquake Design Criteria for Stack-like Structures" published as ASCE Proceedings paper 1696 in the Journal of the Structural Division, July, 1958.

Effect of earthquake forces at setbacks in structures received consideration. And the code includes appropriate specific provisions. However, the committee realizes additional studies will be required for this subject and that the setback provisions may be modified in the future.

One additional new concept in the code states that buildings more than 13 stories or 150 ft in height shall have a complete moment-resisting steel frame capable of resisting not less than 25% of the required seismic load for the structure as a whole. The desirability to utilize known materials for the frame of the structure showing favorable ductility and energy-absorption characteristics prompted inclusion of this paragraph with the wording noted.

Building separations are considered essential and provisions are included to maintain adequate separations between buildings.

The committee also studied requirements for "drift" or story displacement, particularly with regard to wind loads. Only a general warning to consider drift is included at the present time.

Floors and roofs acting as diaphragms are required to be designed for a minimum acceleration of 10% of loads tributary from that story of the building under consideration unless a greater acceleration is required by the basic seismic formula.

• **Why a new code?**—At present there are many different codes covering lateral-force requirements in use in California alone. Although there are similarities in most of the codes, there are also major differences.

The Structural Engineers Association of California was requested by the International Conference of Building Officials to recommend a uniform seismic code covering lateral-force requirements.

The SEAOC committee members are S. B. Barnes, R. W. Binder, John A. Blume, Henry J. Degenkolb, Murray Erick, Herman E. Finch, Norman B. Green, Harold B. Hammill, Roy G. Johnston, Harold S. Kellam, J. E. Meehan, Harald Omsted, Henry C. Powers, G. A. Sedgwick, John E. Rinne, and William T. Wheeler, chairman.

This is an interim code. The committee realizes there is much work still to be done as the results of research and further study become available.

Factors and Definitions

A building with . . .

MOMENT-RESISTING SPACE FRAME that is capable of resisting 100% of the total required lateral forces in the frame alone when assumed to act independently of any other more rigid elements has a **K VALUE of 0.67.**

COMPLETE HORIZONTAL BRACING SYSTEM that will resist all lateral forces and including a moment-resisting space frame that will resist at least 25% of the total required lateral force when acting independently has a **K VALUE of 0.80.**

BOX FRAMING SYSTEM has a **K VALUE of 1.33**
ANY OTHER FRAMING SYSTEM has a **K VALUE of 1.00**

The code uses these definitions:

BOX SYSTEM—a structural system without a complete vertical load-carrying space frame wherein this system resists the required lateral forces by shearing stress in the vertical elements or by axial stress in bracing.

SHEAR WALL—Wall designed as a lateral-force resisting element. Braced frames subject to axial stresses only shall be considered as shear walls for the purpose of this definition.

SPACE FRAME—Structural system composed of individual spaced members other than shear or bearing walls, which are so interconnected and so laterally supported as to function as a complete self-contained unit with or without the aid of horizontal diaphragms or floor bracing systems.

MOMENT-RESISTING SPACE FRAME—One that resists a required lateral force by bending moment in the individual members and joints. This system may or may not be enclosed by or adjoined by more rigid elements, which would tend to prevent the space frame from resisting lateral forces.

VERTICAL-LOAD-CARRYING SPACE FRAME—one designed to carry all superimposed vertical loads.

These factors apply to buildings with—

	K VALUE
A MOMENT RESISTING SPACE FRAME that is capable of resisting 100% of the total required lateral forces in the frame alone when assumed to act independently of any other more rigid elements	0.67
A COMPLETE HORIZONTAL BRACING SYSTEM that will resist all lateral forces and including a moment-resisting space frame which will resist at least 25% of the total required lateral force when acting independently.	0.80
A BOX FRAMING SYSTEM	1.33
ALL OTHER FRAMING SYSTEMS	1.00

And these definitions apply—

BOX SYSTEM is a structural system without a complete vertical load-carrying space frame wherein this system resists the required lateral forces by shearing stress in the vertical elements or by axial stress in bracing.

SHEAR WALL is a wall designed as a lateral-force resisting element. Braced frames subject to axial stresses only shall be considered as shear walls for the purpose of this definition.

SPACE FRAME is a structural system composed of individual spaced members other than shear or bearing walls which are so interconnected and so laterally supported as to function as a complete self-contained unit with or without the aid of horizontal diaphragms or floor bracing systems.

MOMENT-RESISTING SPACE FRAME is one that resists a required lateral force by bending moment in the individual members and joints. This system may or may not be enclosed by or adjoined by more rigid elements which would tend to prevent the space frame from resisting lateral forces.

VERTICAL-LOAD-CARRYING SPACE FRAME is one that is designed to carry all superimposed vertical loads.

Can You Anticipate Your Profits

Samuel T. Florman
Vice President
Kreisler-Borg Construction Co.,
White Plains, N. Y.

KREISLER-BORG CONSTRUCTION CO.

JOB: NEW PUBLIC SCHOOL 21
LOCATION: WESTCHESTER, N.Y.
ARCHITECT: JOHN FORBES, A.I.A.

PERIOD ENDING FEB. 23, 1959
PREPARED BY S.F.
CHECKED BY J.F.

Cost Analysis

NO	ITEM	NAME	COST OR COMMITMENT TO DATE	COST TO COMPLETE	ANTICIPATED TOTAL COST	REMARKS
	SUBCONTRACTS & MAJOR PURCHASE ORDERS					
1	EXCAVATION	AAA EXCAVATORS	2300000	* 50000	2350000	* MAINTAINING TEMPORARY ROADS
2	CONCRETE - MATERIAL	BBB READY-MIX	834921	465079	* 1300000	* MAXIMUM PURCHASE AMOUNT
3	REINFORCING - MATERIAL	CCC STEEL CO.	210000	—	210000	
4	" - INSTALLATION	DDD ERECTORS	185000	—	185000	
5	STEEL & MISC. IRON	EEE FABRICATORS	4200000	* 60000	4260000	* CLAIM, CORRECTING BASE PLATES
6	MASONRY	FFF MASON CO.	7300000	110000	7410000	* 10% EXTRA CASTINGS - 1100.-
7	LATH & PLASTER	GGG PLASTERING CO	900000	—	900000	
8	HOLLOW METAL	HHH STEEL DOOR	175000	—	175000	
9	ROOFING	III ROOFING	1200000	* 20000	1220000	* CLAIM - FLASHING EXTRA OPENINGS
10	WINDOWS	JJJ CO.	1600000	—	1600000	
11	GLAZING	NOT LET	—	830000	830000	
12	ROUGH LUMBER	LLL LUMBER CO.	691463	208537	* 900000	* MAXIMUM PURCHASE AMOUNT
13	MILLWORK	MMM MILLWORK	2850000	* (26000)	2824000	* BACK CHARGES REPAIRING CABINETS
14	HARDWARE	NNN CO.	910000	* 40000	950000	* ALLOWANCE 950.-
15	ASPHALT TILE	OOO FLOOR CO.	340000	* 500.00	890000	* OPTION WAXING 500.-
16	PAINTING	NOT LET	—	2300000	2300000	
17	PLUMBING & HEATING	QQQ HEATING CORP	11000000	—	11000000	
18	ELECTRICAL	RRR ELECTRICAL CO.	4900000	—	4980000	ALTERNATE STAGE LIGHTING 2280.-
	TOTAL SUBCONTRACTS & MAJOR P.O.		40096384	4107616	44204000	
	MISCELLANEOUS MATERIALS & EQUIPMENT					
19	CONCRETE ACCESSORIES, ETC.		74321	20000	94321	
20	NAILS & ROUGH HARDWARE		61273	40000	101273	
21	CRANE & PUMP RENTAL		135000	50000	185000	
	TOTAL MISC. MATERIALS & EQUIPMENT		270594	110000	380594	
	GENERAL CONDITIONS					
22	INSURANCE & WELFARE		835320	892600	1727920	APPROXIMATELY 20% OF LABOR
23	SURVEYS		35000	—	35000	
24	SHANTIES & SUPPLIES		64215	50000	114215	
25	TEMPORARY FACILITIES		231510	60000	291510	
26	GLASS BREAKAGE		—	20000	20000	
27	RUBBISH TRUCKING		16000	12000	28000	
28	TRAVEL & MISC. EXPENSE		62932	75000	137932	
29	GLASS & ALUMINUM CLEANING		—	100000	100000	
	TOTAL GENERAL CONDITIONS		1244977	1209600	2453977	
	LABOR					
30	SUPERVISION		675500	900000	1575500	
31	HAND EXCAVATION		578765	60000	638765	
32	CONCRETE		993036	1000000	1993036	
33	CARPENTRY		1635539	2200000	3835539	
34	CLEANUP & MISC.		293766	300000	593766	
	TOTAL LABOR		4176601	4460000	8636601	
	SUMMARY					
35	SUBCONTRACTS & MAJOR PURCHASE ORDERS		40096384	4107616	44204000	
36	MISC. MATERIALS & EQUIPMENT		270594	110000	380594	
37	GENERAL CONDITIONS		1244977	1209000	2453977	
38	LABOR		4176601	4460000	8636601	
39	FUTURE COSTS ON APPROVED CHANGES		—	210000	210000	
40	CONTINGENCIES		—	200000	200000	
	ANTICIPATED TOTAL COST		45788556	10296616	56085172	
	CONTRACT PRICE				69325289	
	APPROVED CHANGE ORDERS				694116	
	PENDING CHANGES FOR WORK DONE				115974	
	ADJUSTED CONTRACT PRICE				70135289	
	ANTICIPATED TOTAL COST				56085172	
	ANTICIPATED GROSS PROFIT				14050118	

A fact of life that all contractors learn sooner or later is this:

A contractor's accountant is unable to tell him whether or not he is making money.

An accountant can tell a contractor readily enough if he has made money on completed work. But when it comes to profit on current operations, the accountant flounders helplessly in a sea of "Payables" and "Receivables" that can never tell the contractor where he stands while the job is in progress.

The erratic billing habits of the construction industry are at the root of this problem. Usually, the general contractor submits a requisition to each owner on or about the first of each month for work completed during the previous month. The general contractor is billed in turn by his subcontractors and suppliers. But most of these requisitions are half guess and half prayer, not always an accurate reflection of work accomplished and payments due.

There is always the natural inclina-

Here's How to

1. Prepare in outline the cost analysis form shown at left, based on your estimate breakdown. (This one has been simplified for the sake of clarity, all of its classifications can be broken down in as much detail as desired.) If you wish, add a column to show the estimate figure for each item.

2. Each month have your bookkeeper fill in the "Cost or Commitment to Date" column.

- In the case of lump sum subcontracts or purchase orders, he enters the total commitment, including change orders, not the amount requisitioned to date.
- For open end purchase orders, he enters the amount billed to date, but in the "Remarks" column he gives the estimated maximum cost of this item. (This should be recorded on the office copy of all purchase orders by the person doing the purchasing).
- Options, alternates or other special

◀ *A cost analysis form can help you determine your profits.*

on a Current Job?

tion of both general contractor and subcontractor to over-requisition. There is also the caution of the owner, who tries to hold back enough to protect himself, and of the G. C. who has the same problem with his subs. And worse yet many subcontractors with modest office establishments requisition informally and at random—often late, and often by telephone.

If the contractor guides himself on a cash basis, such unpredictable behavior will often result in some bizarre situations.

After a few months of work, an optimistic general contractor may take a substantial amount of money out of a job that will eventually show no profit at all. If he has "earned" this money during the current period, he will surely "lose" it in the months ahead. Conversely, an overly cautious owner may show a cash deficit on a job destined to return a handsome profit when completed.

• **Key: anticipated gross is the key**—Of course, after a job is complete and all accounts settled, the books tell the whole story. But this is too late for sensible business planning. Only if the accountant can learn in advance what the *anticipated gross profit* is on each project, can he proceed in a rational way. He "picks up" as gross earnings each month a certain percentage of the anticipated gross profit on each job, based on the percentage of completion to date.

Anticipated gross profit remaining to be picked up during a given future period can be readily compared with known overhead expense during the same period and a clear long-term picture of net profit prospects emerges. Looked at another way, the percent of anticipated gross profit can be calculated by comparing it with total volume. If this percentage, for example, is 5%, and monthly overhead is $5,000, then the contractor knows that he must complete work grossing at least $100,000 each month in order to merely break even.

The advantages of having this information on anticipated profits are obvious. The contractor is guided in planning his work program. He can foresee what his tax problems will be long before they are upon him. Within limits, he can take steps to adjust his overhead in a sensible way, and he learns quickly when matters demand closer watching or corrective action on any one of his jobs.

• **Original bid is not enough**—This is all very well, one might say, but aren't these anticipated profits calculated when a job is bid? True, they are, and for the first month or two of the job's progress this estimate figure will suffice, modified somewhat as the results of the buying are known. But there comes a time when labor costs begin to pile up, when there are changes in other factors—general conditions, miscellaneous purchases, changes, claims and all those hidden items. These have a way of altering estimated profits in the most astonishing ways.

How, then, can a contractor calculate anticipated gross profit for jobs in progress? Large contracting firms have special departments set up to handle this problem with methods of their own. But firms of less than giant size cannot afford such a luxury. The method proposed here is neither perfect nor totally original, but it is simple enough to be prepared by a bookkeeper and a project manager without much loss of time. In that it gives the contractor every opportunity to look ahead realistically, it is reasonably foolproof.

You'll find this method outlined at left.

Figure Profits

provisions of subcontracts or purchase orders should be entered in the "Remarks" column by the bookkeeper.

3. Next, your project manager takes over and fills in the all-important "Cost to Complete" column.

• For subcontract items which have not yet been awarded, he enters either the original estimate figure or his latest estimate of what this figure will be.

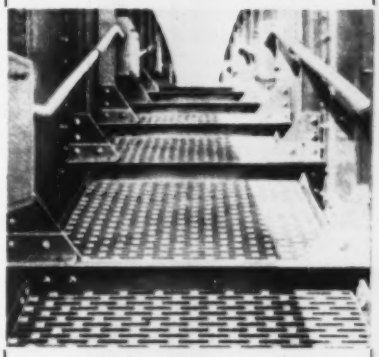
• He must use his best common sense in allowing for pending subcontractors' claims and changes, making appropriate explanations in the "Remarks" column.

• He must reappraise realistically his cost-to-complete for General Conditions, Materials and Labor.

• Special pains must be taken to see that for each owner's change order recorded, all applicable costs or contemplated costs are taken into account.

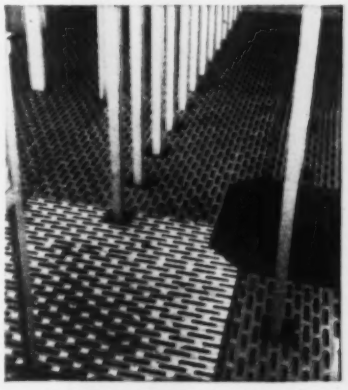
The anticipated gross profit arrived at on the bottom line will vary month by month, but will gradually zero in on the right figure as the job progresses.

WASHINGTON ALUMINUM GRATING FITS EVERY REQUIREMENT



WALKWAYS & RAMPS

Exclusive I-Beam Design rivals structural strength of steel at fraction of weight. Can be fabricated to support any weight load; to any length, width or shape. Cutouts are reinforced.



FLOORING & PIT COVERS

Patented upset design provides non-skid all direction safety under wet, greasy, other hazardous conditions. Maintenance-free, non-magnetic, non-sparking. Won't chip, splinter or crack.

SEND FOR FREE FACT BROCHURE

WACO®

WASHINGTON ALUMINUM COMPANY, INC. Dept. 3131
Baltimore 29, Maryland

WALLACE E. HUNT, SR.
of Industrial Asphalt says...

From the General Office of
Industrial Asphalt
THE BRAND OF DISTINCTION IA

CRESTVIEW 1-5123
1100 SO. BEVERLY DRIVE
LOS ANGELES 35, CALIF.

January 12, 1959

Mr. Kenneth Lindsay, Executive Vice President
Iowa Manufacturing Company
Cedar Rapids, Iowa

Dear Mr. Lindsay:

It just occurred to us that you might be interested in knowing that after using our new Cedar Rapids Bituminous Paver for several months, it has won the slogan in our company, "THE FASTEST PAVER ALIVE".

Its precision performance is far beyond our expectations. Our operators fight to be assigned to the modern finger-tip controlled paver.

We have ordered another new Cedar Rapids Bituminous Paver through Brown-Bevis Company in Los Angeles to use exclusively for our big paving job for the U.S. Navy Missile Base on San Nicholas Island under subcontract from Ball & Simpson.

We selected your paver because speed of operations, maximum production, quality and dependability are important factors on this remote island job.

Best wishes for your continued success.

Sincerely yours,

Wallace E. Hunt, Sr.
Chairman of the Board
INDUSTRIAL ASPHALT OF LOS ANGELES, INC.

WEH:pmc

Nation's largest manufacturer of asphaltic paving materials endorses speed and performance of Cedarapids Paver

When INDUSTRIAL ASPHALT finds a machine that helps them maintain and improve their position as Number One "Manufacturing Specialists" in the bituminous pavement field, they latch onto it quick! That's why, after their enthusiastic acceptance of Cedarapids Bituminous Paver high speed performance and precision in laying perfect mat, they ordered their second Cedarapids.

Industrial Asphalt, which serves California with 30 plants producing bituminous material, is famous for meeting the most rigid specifications, maintaining a fast production schedule, and giving always-reliable service. Cedarapids is proud that Cedarapids Bituminous Pavers . . ."The Fastest Pavers Alive". . . have been chosen to meet the high standards of production set by Industrial Asphalt.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

Follow the lead of the leaders . . .

SEND FOR THIS BULLETIN TODAY!

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

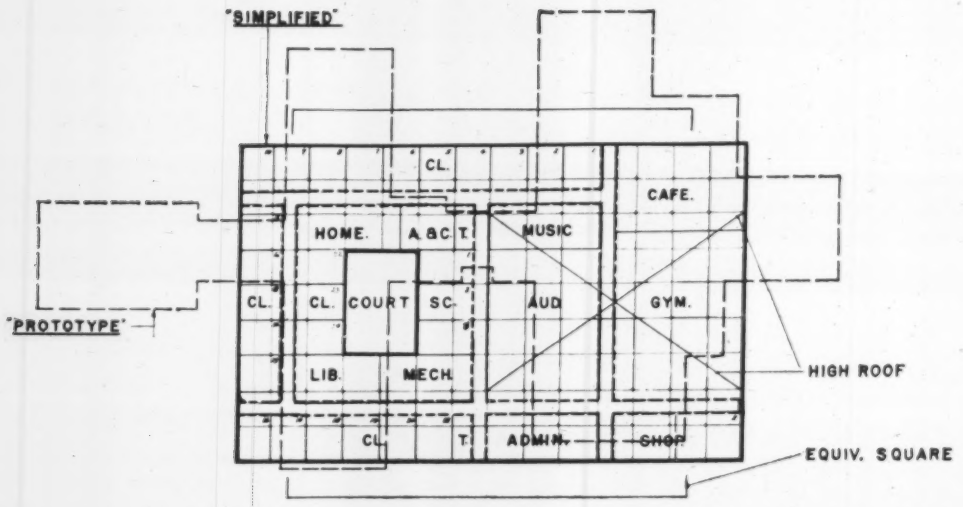
Gentlemen: Please send Bulletin PAV-1, and the complete story of the "Fastest Paver Alive".

Name _____ Title _____

Company _____

Address _____

City _____ State _____



Simple plan (red), with court and one high-roof area, does more for less than the prototype plan.

How to Save Money on Schools:

James S. Minges
Partner
Marchant & Minges-Engineers
West Hartford, Conn.

Many millions of dollars will be wasted this year because our schools are more complicated to build than they should be. Other millions of dollars will be spent needlessly this year on operating and maintenance costs on the same type of complicated school buildings.

After having provided the structural and mechanical engineering work (the major cost of the buildings) for over 180 schools of all shapes and sizes, I am convinced that a substantial savings could be made in designing more simplified buildings.

Applying this thinking to some specific projects, I studied three typical secondary schools designed by three different architectural firms on the basis of how economy is affected by such factors as a perimeter, simplified plan and amount of glass. I found that the conventional secondary school building ("Prototype" shown on the floor plan) can be reduced in debt service (initial plus interest costs) and maintenance and operating costs by 25%, by adhering to some well known engineering principles. (The study also included an evaluation of the all important "comfort" considerations that are built into the structure.)

• Cost-learning ratio—Dollar savings alone were not the only consideration. I tried to keep in mind the cost element "dollars per unit of learning" instead of the usual unit, "dollars per square foot." Any constructional feature of the building must be related not only to the costs mentioned but to this question: "Are the students getting more over-all learning?"

If the environment in a school cannot be satisfactorily controlled then we have been unsuccessful in achieving the basic function of providing learning. A pupil subjected to too much heat or too much cold, for example, is not learning as much as he could. Under the same conditions, the teacher cannot teach at maximum efficiency.

• Designs compared—Shown in plan is the prototype building, which is typical of the three buildings studied. It represents an 800-pupil secondary school with 75,000 sq ft of floor area. It cost $1.2 million to build, $16.00 per sq ft, which is about the average of the cost of the three schools studied.

The prototype has 34 corners and a perimeter double that which can be enclosed in a square with equivalent floor area. The plan also shows the equiva-

What the Simplified Plan Saves

ITEM	COST – DOLLARS								COMFORT	
	DEBT SERVICE		OPERATING		MAINTENANCE		TOTAL			
	–	+	–	+	–	+	–	+	–	+
① PERIMETER REDUCTION	$24,500		$35,800		$6,100		$166,400			●
② REPETITIVE DESIGN BUILD. LESS TRADES	126,000		100		100		126,200			
③ REPETITIVE DESIGN TRADES	81,000		3,200		2,500		86,700			
④ SPACE REDUCTION	90,000		14,600		3,000		107,600			
⑤ GLASS REDUCTION	10,500		29,800		5,800		46,100			●
①-⑤ TOTAL	432,000		83,500		17,500		533,000			
⑥ INSULATION		19,200	76,600				57,400			●
⑦ DOUBLE GLAZING		11,100	12,500			3,200	(1,800)			●
⑧ SUN CONTROL		8,000				2,000	(10,000)			●
⑨ WINTER AIR COND		22,500		27,000		1,000	(50,500)			●
⑩ LIGHTING		8,500		13,500		4,500	(26,500)			●
⑥-⑩ TOTAL		69,300	89,100	40,500		10,700	(31,400)			
①-⑩ TOTAL	362,700		132,100		6,800		501,600			
⑪ SUMMER AIR COND.		158,000		151,000		31,000	(340,000)			●
①-⑪ TOTAL	$204,700		$(18,900)		$(24,200)		$161,600			

The Simplified Plan vs. . . . the Prototype

• CLASS, LAB, LIB, MUSIC, SHOP	30,000
• AUD, GYM, CAFE.	15,000
• ADMIN.	3,750
• MECH.	2,750
• COR, STOR, TOIL, LOCK.	18,700
TOTAL SQ. FT.	70,200
BUILD. COST	$958,200
COST - SQ. FT.	$ 13.63
DEBT SERVICE (30 YR)	$1,437,300
OPER. & MAINT. (30 YR.)	$1,511,100

• CLASS, LAB, LIB, MUSIC, SHOP	30,000
• AUD, GYM, CAFE.	15,000
• ADMIN.	3,750
• MECH.	3,750
• COR, STOR, TOIL, LOCK,	22,500
TOTAL SQ. FT.	75,000
BUILD. COST	$1,200,000
COST - SQ. FT.	$ 16.00
DEBT SERVICE (30 YR)	$1,800,000
OPER. & MAINT. (30 YR.)	$1,650,000

Debt service and maintenance, as well as initial cost, are less with the simplified plan.

Simplified Design

lent square equal in area to that of the prototype. Overlaying the prototype is a building noted as "Simplified." It has a 24-ft column spacing in both directions and an open court area in the center of the classroom section.

Many different bay spacings for the simplified building were studied. The 24-ft module seemed to work out best, considering classroom size, structural framing, heating, lighting and other features. The prototype has six changes in roof level, the simplified design only two.

The table above gives a cost breakdown of the debt service. This includes first cost, interest and amortization and the operating and maintenance expense —both on a 30-year basis. The last column indicates the beneficial effect on comfort of the simplified building in comparison with the prototype building. Items 1 through 5 show the cost reductions that can be made in simplifying the typical secondary school building.

The simplified layout is a compromise between the prototype and the equivalent square. Laid out on the basis of equivalent usable teaching areas of plan components, such as classrooms, auditorium, gym, administration, the simplified plan has effected reductions in non-teaching areas such as corridors, toilets and mechanical spaces. The glass in the Simplified building would be cut down from that used in the prototype to a unit 2 ft 8 in. in plan and 4 ft in height, in each 8-ft bay.

The prototype building cost is $1,200,000, plus $600,000 for interest and amortization, totaling $1,800,000.

• **Savings with less wall**—Certainly we can achieve greater economy with simpler plans and reduction in the length of perimeter walls, and these savings are shown in the table.

It is apparent that the most economical building shape for enclosing a space is a square in plan. I have found that the perimeter of the average school in New England is twice that of a square building. This means that the perimeter of the average school building is twice as expensive as it should be.

For various reasons, however, a building cannot be a perfect square. We must consider the changes in elevation on a sloping site, layout of the spaces in relation to one another, classroom exposure and the over-all architecture.

The average cost per linear foot of an exterior wall in Connecticut for a one-story building is $100. With a reduced perimeter, not only would we have initial cost savings of $100 per lin ft, but we also would have a greatly reduced operating and maintenance expense. We would have fewer windows to wash, less pointing of masonry, less flashing, and less heat loss.

• **Make the frame simple**—On the left, items 2 and 3 in the table show the money saved by using a repetitive module in building design. A good gage of the complexity and cost of a project is the number of drawings, sections, details and specifications required. There are far too many finishes in the architectural trades, too many types of lighting fixtures and too many heating elements in the mechanical trades in the prototype building.

The engineer can always gage the cost of a building by the size of the column schedule. If the column schedule is large, with many types, lengths and sizes of columns, we can be sure it is a costly and complicated job. On a typical secondary school there are as many as 50 to 60 different groups of columns involving six or seven changes in roof level. There should be no more than four or five different types of columns and no more than two changes in level if we want an economical building.

If there are many different sizes of columns, the structural system just has to cost more, requiring more special and costly details of construction. There are also accompanying problems of fabrication and field work. A simplified, repetitive structural system is the backbone of economy, since it sets the module pattern of the whole building. A simplified school can be initially designed and built in half the time it takes to build the prototype school.

A result of repetitive and compact planning is reduced corridor areas and mechanical spaces, which reflect the savings shown in Item 4 of the same chart.

• **What about glass?**—Item 5 relates to glass reduction. The large glass areas so prevalent in today's school design make it impossible to provide comfort in the classroom. Because of the low temperature in the large glass areas during the heating season, cold down drafts are produced, as well as a cold floor. These large, cold glass areas in winter also create very uncomfortable conditions because of an excessive radiant loss from the occupants to the cold surface of the glass.

The normal secondary school now

. . . Save school money with more insulation and less glass

has 40% of the exterior walls in glass. It should be reduced to half that amount.

Much has been written about using natural lighting for classrooms, thus saving on artificial light. The facts are that the sky is overcast a large percentage of the time and that most school teachers turn on the artificial lights in the morning and leave them on all day, regardless of the type of day. Day lighting in New England for example, is economically impossible to achieve.

Bilateral lighting—sky lights, plastic domes—are expensive to install, operate and maintain. Furthermore, glass costs more than a masonry wall. When summer cooling comes into the picture, and it will in the future, our present school buildings will have to be drastically modified to cut down the terrific heat gain from the sun.

• **Substantial saving possible**—In utilizing the simplified building design as indicated in items 1 through 5, there is a debt service savings for the simplified building, compared with the prototype, of $432,000, operating savings of $83,500 and maintenance savings of $17,500, for a total savings of $533,000 over a 30-year period. The simplified building would also be more comfortable than the prototype building.

Items 6 through 10 include those construction features that would be more costly initially, but which I feel are justified from operational and comfort aspects. These items are not now installed in conventional schools.

• **Spend more on insulation**—In the attempt to keep initial costs down, the average school designer does not provide sufficient insulation. Because of the increase in fuel costs and because of comfort considerations, wall and roof insulation should be increased. The initial extra costs can be written off in about four years.

All glass should be double glazed and provided with sun shading. Though it may be difficult to justify the added expense of double glazing on the basis of heat loss, it can be easily justified on the basis of comfort.

Certainly more scientific data will have to be obtained to determine how much efficiency and productivity of teacher and pupil can be increased by proper environmental control. Comfort will go hand in hand with increased health and learning efficiency.

One of the factors long neglected is mean radiant temperature (MRT). The MRT of a space is the average inside temperature of all walls, ceilings and roofs. It has a direct relationship to the comfort of occupants in that it is a measure of the amount of heat transmitted by radiation from the occupants to the enclosing surfaces. (A low temperature in winter, approaching 62 F, and a high surface temperature in summer, approaching 80 F, represents discomfort.) The MRT is "built into the structure by the thermal properties of the material used."

The classroom certainly presents a complex problem of heating and ventilating due to the many heat losses and gains. The classroom on the south, west and east needs to be on a cooling cycle 75% of the average classroom time due to sun, pupil and lighting heat gains. We are doing an injustice to the pupil if we provide heating and ventilating systems that will not adequately provide for all the features necessary for comfort.

• **Provide adequate lighting**—We are in the dark ages when it comes to lighting levels. After an extensive study by the Illuminating Engineering Society, attension is being directed to many new concepts of lighting. One is that with enough light the eye receives impressions (assimilations) of a seeing task at the rate of ten times per second. The IES recommends that enough light be provided so that at least five assimilations per second can be achieved.

Generally recognized classroom lighting standards are based on 30 ft-c of lighting intensity, which would provide only enough light for some classroom tasks of only three assimilations per second. For the eye to receive five assimilations per second, it is necessary to have 70 ft-c of light for some classroom tasks. We should, therefore, be designing our lighting systems to provide 70 ft-c of lighting so that students can see and do their school tasks adequately. (Since 1910 lighting prescribed in various building codes has increased in intensity from 3 ft-c to the present recommended level of 70.)

I believe that items 6 through 10 are well worth the added initial expense. On a 30-year basis, the actual overall cost of installing these five comfort items is only $31,400, whereas the 30-year savings with insulation is $57,400.

• **Consider air conditioning**—There is one other noteworthy item in this table and that is the addition of summer air conditioning. Though it would be unusual to include summer air conditioning for the present nine-month occupancy period in New England, extending the school year into the summer season would make it possible to justify the high cost more easily.

There are very few schools designed today with provision for the addition of future cooling. If we extended the school year into the summer months, it would be futile to try to educate children in a non-air-conditioned school.

It would be possible to add summer air conditioning to the simplified building and still come out with a total first-cost saving over the prototype. The importance of cutting down the amount of glass when summer cooling is used is pointed up by the fact that every square foot of unshaded glass on the south, east and west adds about $10 to the first cost of air-conditioning.

• **Check list**—Here's a check list I believe should be used by architects and engineers for every space affecting the physical and emotional needs of school occupants: insulation, double glazing, sun control orient, temperature control, humidity control, air control, lighting, cooling, mean radiant temperature, ventilating sash, white reflective roof, vapor barrier, vestibule, weather-stripping, non-confinement, pleasant atmosphere, color and light contrasts and fire safety.

Most of the items have been covered; some deserve more comment:

• Too little attention has been placed on mean radiant temperature. For example, a three-degree change in (MRT) has more effect on comfort than a three-degree air temperature change. If a space has large glass areas and insufficient insulation, it it practically impossible to provide comfort to the occupants in cold and hot weather.

• All occupied spaces should have ventilating sash, preferably the casement-window type, so that occupants can get out in case of fire and other emergency. Without summer air conditioning in the spring and fall, it is necessary to have sufficient window ventilation, with operating sash high and low in all occupied spaces.

• For the small initial extra cost, a white reflective roof is well worth installing. It has been determined that the temperature of the roof is as much as 40F lower with a white reflective roof under a high sun load than with the usual dark traprock roof topping.

• All exterior doors should be weatherstripped and all entrances to schools should have vestibules to cut down excessive drafts and infiltration.

• There are very few schools, new or old, that can be called fire safe. All schools should have adequate fire alarms and sprinkler systems. And there should be a control that will cut off the fans on all ventilating and air systems during a fire. Certainly the fire regulations for most states are minimum; merely complying with the code is not enough to make our schools safe from fire.

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BUILDING COSTS REPORT AND OUTLOOK

1st Quarterly Cost Roundup

What to Look for . . .

ENR's first 1959 cost report turns the spotlight on building costs and the prices and wages that influence them. The following pages present a wealth of useful data for your business planning.

Other cost reports will follow at quarterly intervals.

The next report, in June, will cover highway costs. In September, materials prices takes center stage and the December report will concentrate on labor costs.

. . . and Where to Find It

The ENR Cost Indexes, 1913-59 **opposite page**
The special foldout section at right shows past, present and future trends in construction costs. It's designed for continuous use.

Wage and Price Hikes Push Costs Up **page 76**
ENR's Cost Indexes are in their 10th straight year of increases. How much? Between 3% and 4%, depending on the outcome of union bargaining sessions and the expected rise in steel prices.

ENR Indexes: How They're Used **77**
The indexes are benchmarks for you to use in measuring your own price and cost forecasts. They have a long history of predicting both direction and degree of cost changes accurately.

Which Cost Yardstick to Use **78**
To help you choose the most appropriate of the many indexes, ENR explains how they differ from one another in purpose and scope.

Price Indexes Rise With Costs **80**
Contractor prices are going up with costs—but at a slower rate. Increased management productivity offsets part of the cost rise this year.

Cost Trends by Type of Building **82**
Fourteen different indexes show the cost trends in eight categories of building construction from 1913 through this month.

Industrial Equipment Rise Slowed Last Year **94**
Cost of industrial equipment, installed, rose less last year than it did in 1957.

Highway Bids Buck Price Trend **96**
A sharp increase in competition was evident in six states where fourth quarter bid prices dropped.

Costs of Construction's Basic Four 'M's **101**
Money: Prudent Timing Can Save Interests Costs.
Machinery: No More Increases Likely Until Late '60.
Manpower: Long-Term Contracts Press Wages Up.
Materials: More Hikes Than in '58.

Housing Costs Up, Mechanicals Down **103**
Public housing costs in New York City inched up 2% in 1958 over 1957. More significant was the smaller percentage of the housing dollar taken by mechanicals.

Do-It-Yourself Cost Eestimator **105**
To prevent the shock and expensive delays that come of inadequate cost-estimating, read a Connecticut company's guide and worksheet for "Determining Areas and Approximate Cost of Schools."

Chicago Analyzes Costs for New Schools **106**
The Windy City's intensive schoolbuilding program has produced some cost and space ratios not usually available for analyzing unit costs.

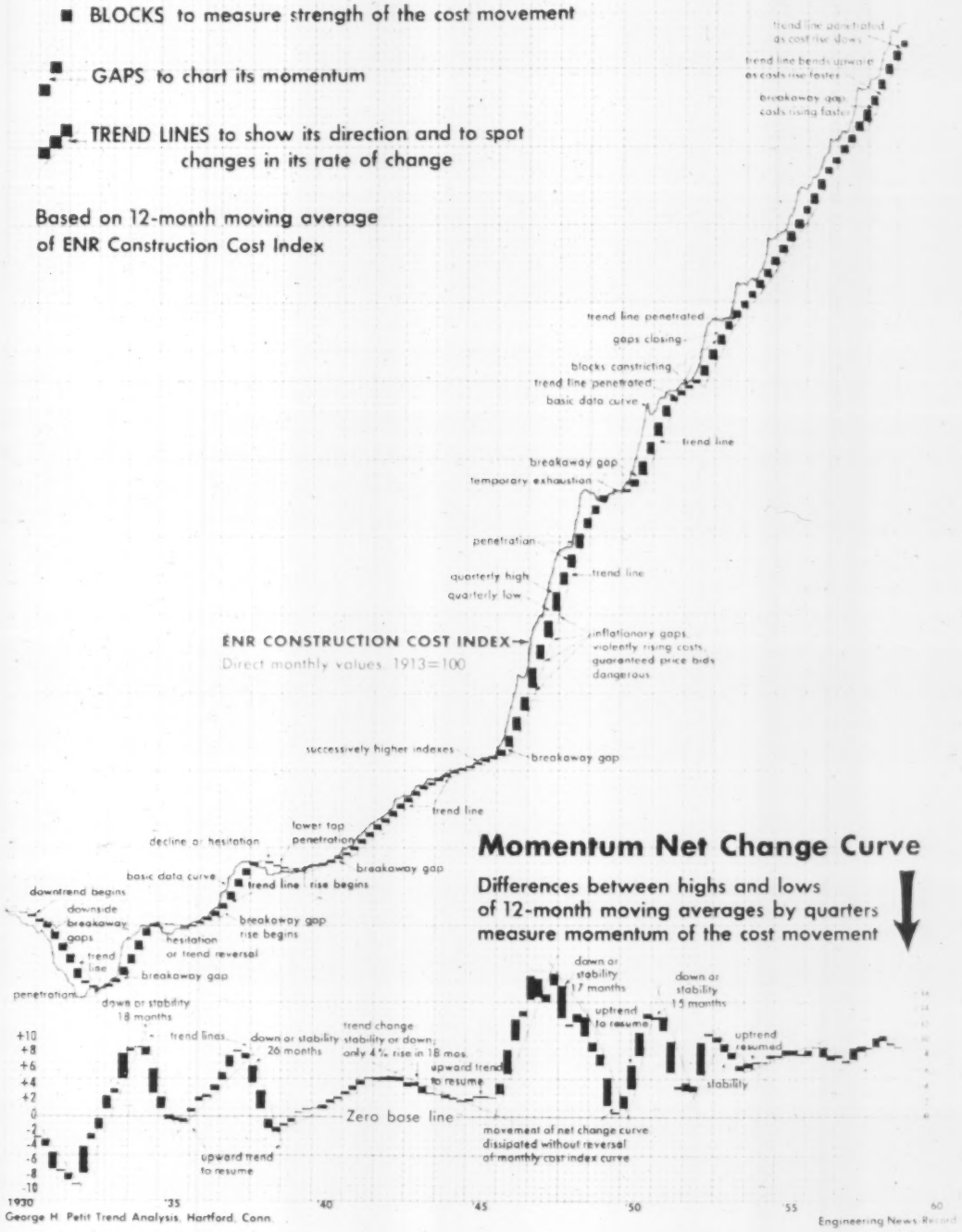
Where the Building Dollar Goes **111**

Construction Cost Trend Recognition

3-way Petit Test – Uses BLOCKS • GAPS • TREND LINES

- BLOCKS to measure strength of the cost movement
- GAPS to chart its momentum
- TREND LINES to show its direction and to spot changes in its rate of change

Based on 12-month moving average of ENR Construction Cost Index



Momentum Net Change Curve

Differences between highs and lows of 12-month moving averages by quarters measure momentum of the cost movement

Supplement to Engineering News-Record, March 19, 1959. Business News Department, Engineering News-Record, 330 W. 42nd St., P.O. Box 89, Times Sq. Sta., New York 36, N.Y. Reprints are available at 50 cents each. Multicopy rates on request.

Engineering News-Record 20-Cities Cost Indexes (1913 = 100)

CONSTRUCTION COST

	1926	1932	1939	1940	1942	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Jan	207.2	162.5	234.7	238.3	267.6	302.5	316.3	387.0	441.7	477.4	484.7	532.5	548.4	587.9	614.1	643.7	676.4	707.9	743.4	778.3
Feb	206.6	161.8	234.3	238.3	269.4	303.7	319.5	393.7	442.7	475.4	484.9	538.6	549.9	587.8	614.7	645.2	680.2	710.1	743.8	778.8
Mar	207.7	157.2	234.4	238.3	269.7	304.5	323.8	395.5	443.6	474.8	488.4	539.8	551.2	588.0	614.0	645.7	680.2	708.6	744.4	780.7*
Apr	207.1	153.1	234.9	238.3	271.8	306.4	334.6	399.6	443.6	474.3	491.9	540.6	554.7	590.1	615.4	647.5	683.3	709.3	745.8	
May	207.3	152.8	234.7	238.9	272.3	307.4	339.7	400.0	444.9	472.1	496.6	543.5	557.7	589.6	618.7	653.3	688.4	715.7	751.6	
June	204.8	152.2	235.0	241.6	274.2	309.0	348.7	406.6	455.8	473.8	506.9	543.4	562.3	593.7	621.9	656.0	692.1	721.4	757.3	
July	207.8	153.4	234.9	242.2	277.7	309.0	354.7	413.8	464.8	477.5	512.7	542.9	571.3	604.6	628.3	660.1	694.8	724.2	762.5	
Aug	208.3	156.8	234.9	242.2	281.6	309.1	361.4	422.9	477.1	478.3	521.4	543.5	584.3	612.6	641.7	672.2	696.3	738.6	764.4	
Sept	208.3	158.0	235.0	244.1	281.6	309.3	360.2	426.4	478.4	479.8	531.0	543.6	586.7	610.9	640.2	672.7	704.9	737.8	773.5	
Oct	209.8	159.2	236.9	245.0	282.4	309.3	360.9	434.6	480.2	480.5	536.2	547.1	589.0	611.6	641.5	673.9	703.9	737.1	775.3	
Nov	210.8	158.2	238.2	247.2	283.6	309.3	362.5	436.9	478.3	480.0	530.0	547.6	589.2	611.8	642.4	673.2	704.1	737.4	774.1	
Dec	210.8	158.5	238.2	249.1	283.7	313.5	369.3	441.1	477.7	480.3	530.8	548.3	588.1	611.3	642.7	673.1	703.8	738.1	773.8	
Av	208.0	157.0	235.5	242.0	276.3	307.8	346.0	413.2	460.7	477.0	509.6	542.6	569.4	600.0	628.0	659.7	692.4	723.9	759.2	

BUILDING COST

	1926	1932	1939	1940	1942	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Jan	183.9	150.6	196.2	201.5	217.1	236.5	242.2	294.6	333.6	355.0	356.2	393.0	405.8	425.0	436.4	457.9	480.5	502.0	516.8	536.2
Feb	183.7	147.2	196.2	201.5	218.4	237.7	243.9	301.6	335.5	352.9	356.5	398.2	406.2	425.2	437.1	459.4	483.1	502.6	515.8	537.3
Mar	184.3	145.9	196.5	201.5	218.9	237.9	245.4	303.3	334.2	352.5	360.0	399.3	407.4	424.9	436.7	459.6	483.1	501.4	516.1	539.7*
Apr	184.1	135.7	196.5	201.4	219.6	238.5	254.4	305.2	334.6	351.4	362.8	400.1	407.9	426.4	437.5	460.6	485.6	501.4	516.6	
May	183.6	136.4	196.6	201.2	220.1	238.5	258.1	304.6	333.9	348.9	364.3	401.1	410.3	426.2	438.2	462.6	487.4	503.0	518.6	
June	181.8	137.6	196.4	201.7	221.2	239.4	265.3	307.4	339.3	349.3	373.4	400.8	412.5	426.2	439.7	464.8	488.7	504.2	521.1	
July	184.3	139.5	196.8	201.7	223.5	239.6	267.3	308.9	342.4	349.5	377.7	400.3	414.5	435.2	444.1	467.5	489.2	506.6	524.3	
Aug	185.1	138.4	196.5	201.7	225.4	239.9	272.3	317.8	355.5	350.9	383.1	400.2	422.4	436.9	455.5	480.0	491.2	516.9	525.6	
Sept	185.1	139.6	196.6	203.1	225.5	240.1	272.4	322.6	356.7	352.0	392.8	400.3	424.4	436.0	454.3	479.2	500.1	516.1	535.0	
Oct	188.0	140.0	198.5	204.2	225.9	240.4	273.0	327.3	357.1	353.0	397.4	403.4	424.8	436.0	455.5	478.0	499.5	516.8	536.5	
Nov	188.0	139.5	201.2	206.2	226.6	240.6	274.0	329.2	355.9	352.9	390.2	404.5	426.0	436.0	456.3	479.3	500.5	516.8	535.0	
Dec	188.0	140.0	201.2	208.2	226.6	240.8	280.0	333.1	355.6	353.2	391.4	405.8	424.9	435.5	456.8	478.7	500.2	516.3	534.8	
Av	185.0	140.9	197.4	202.8	222.4	239.1	262.3	313.0	344.5	351.8	375.5	400.6	415.6	430.8	445.7	468.8	490.8	508.7	524.7	

* Weekly index as of Feb. 19

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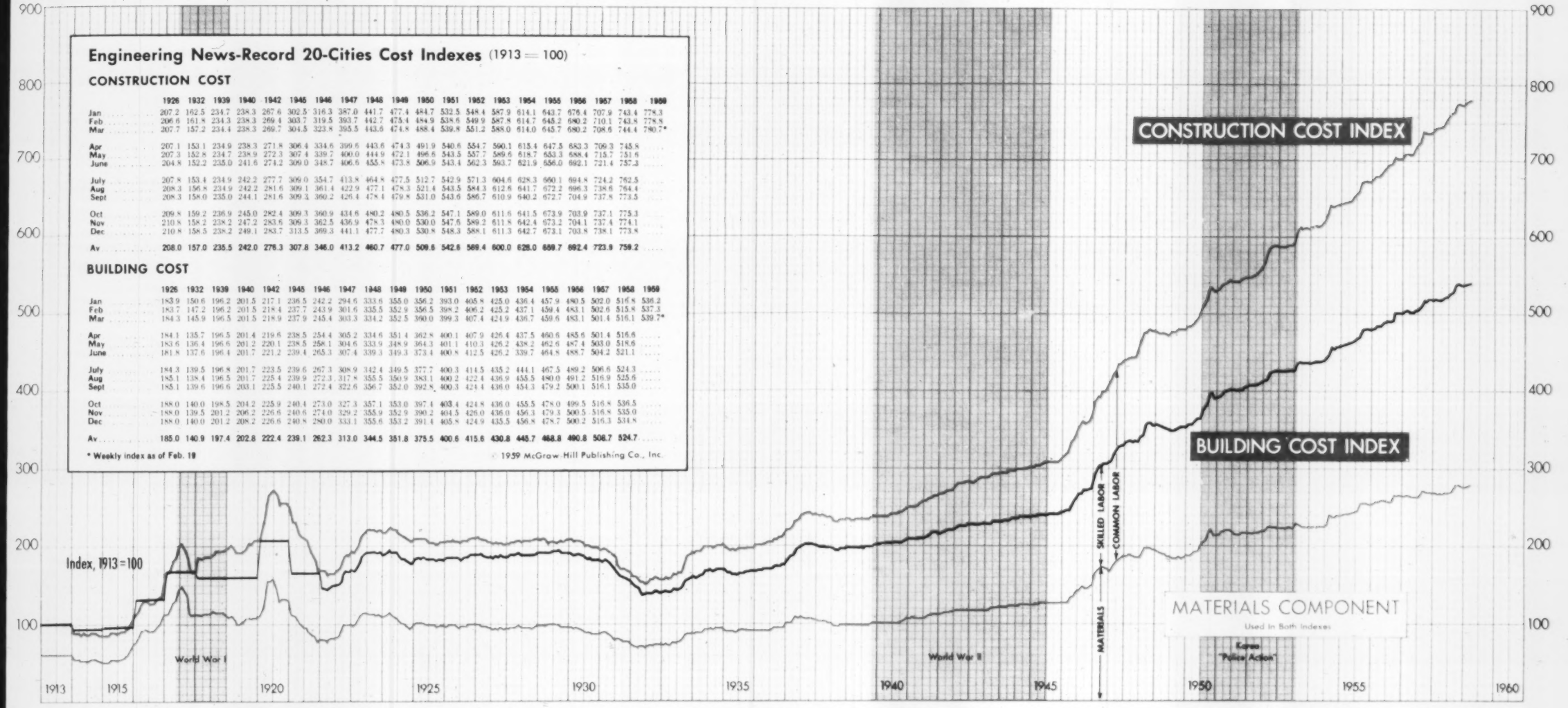
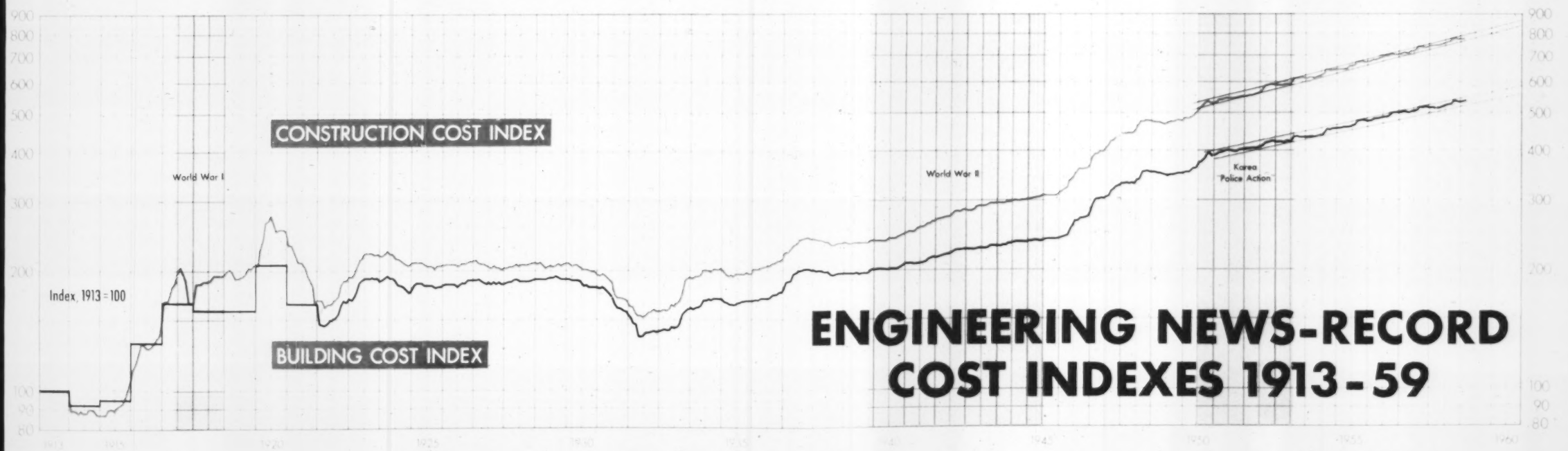
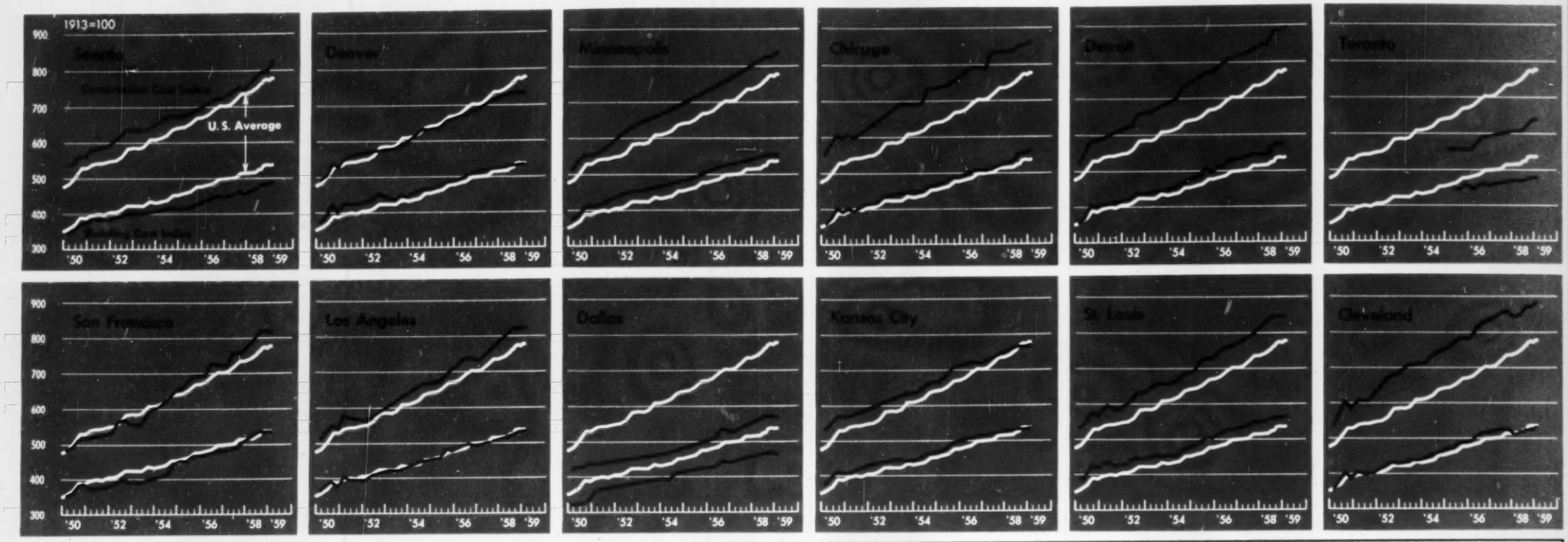




ENGINEERING NEWS-RECORD COST INDEXES 1913-59

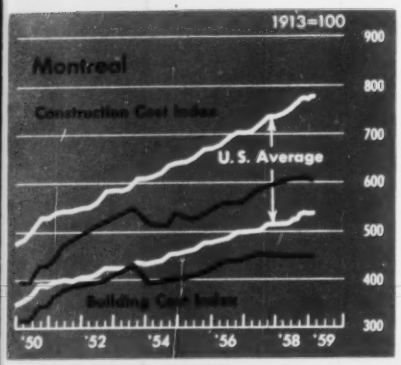


CONSTRUCTION COST INDEXES IN 22 CITIES, 1913 = 100

	1948		1949				1950				1951				1952				1953				1954				1955				1956				1957				1958				1959	
	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Feb	
Atlanta	325	345	345	345	345	345	354	354	394	390	395	395	395	395	395	397	402	418	424	438	460	460	458	458	474	474	474	472	492	495	502	502	522	522	523	523	550	548	538	538	584	584	595	Atlanta
Baltimore	462	462	462	425	424	424	427	462	479	474	486	488	482	513	510	511	530	526	524	525	551	553	543	548	551	558	574	575	595	592	595	601	602	632	643	670	670	672	701	708	709	711		Baltimore
Birmingham	378	379	379	389	389	377	381	381	388	413	416	416	416	416	417	417	450	450	450	447	489	465	465	465	488	507	511	511	519	531	516	519	532	536	556	563	593	593	593	609	619	621		Birmingham
Boston	513	508	507	526	525	532	536	556	570	563	576	586	580	588	590	614	630	629	626	623	626	624	627	630	660	621	675	696	709	700	712	744	746	747	744	746	773	765	764	793	809	807	803	Boston
Chicago	547	530	527	526	541	542	550	584	607	583	603	598	620	624	626	626	661	661	661	660	641	650	692	693	733	738	736	741	752	762	760	788	792	790	780	831	838	806	835	838	857	850	863	Chicago
Cincinnati	505	505	490	487	496	496	502	510	568	553	550	556	543	548	547	553	572	600	609	613	633	631	630	630	641	642	645	661	673	671	674	680	712	713	713	751	748	745	746	780	777	777		Cincinnati
Cleveland	535	523	520	514	525	530	537	578	605	587	607	606	603	626	625	685	684	682	682	706	709	708	712	731	738	731	739	762	785	785	785	809	826	819	820	856	861	829	847	850	871	880	889	Cleveland
Dallas	398	398	398	398	394	397	422	423	421	438	437	437	437	437	437	437	455	455	455	463	470	482	484	484	488	507	510	512	509	514	518	525	525	547	547	547	553	573	573	573				Dallas
Denver	490	496	482	482	470	470	491	506	511	528	552	558	561	564	571	572	577	612	602	582	604	595	595	597	603	602	635	617	656	653	655	670	680	696	697	702	710	710	725	725	731	731	731	Denver
Detroit	511	500	501	489	514	515	523	555	583	592	592	602	601	601	621	625	636	663	663	663	687	682	683	700	729	729	743	763	776	772	778	800	810	808	809	823	832	831	852	852	889	892	892	Detroit
Kansas City	500	500	484	501	511	511	528	551	571	570	570	575	586	586	586	588	623	623	623	623	630	630	635	635	661	663	664	685	702	702	705	709	720	715	715	735	742	742	742	762	768	768	768	Kansas City
Los Angeles	511	495	482	478	480	494	511	529	552	587	580	572	558	569	565	574	610	610	610	612	627	626	634	630	665	687	687	672	705	708	714	731	746	731	731	731	778	778	774	814	822	824	824	Los Angeles
Minneapolis	512	510	504	504	512	512	516	538	555	562	557	587	587	592	593	593	628	628	628	655	661	661	661	685	697	697	697	711	720	720	721	747	752	752	758	781	788	788	803	818	825	824	839	Minneapolis
New Orleans	350	354	379	379	379	379	383	402	408	438	441	439	434	437	435	437	466	466	476	486	506	502	500	510	528	523	522	535	545	545	547	564	567	568	563	572	581	591	588	591	602	617	617	New Orleans
New York	549	541	537	534	538	539	546	575	632	622	630	627	621	626	623	629	667	665	665	664	713	713	732	732	742	737	747	750	774	791	816	819	847	842	852	872	890	888	910	912	953	940	963	New York
Philadelphia	470	467	462	462	517	515	518	541	556	575	573	575	582	582	601	616	636	636	636	635	656	666	666	681	691	691	696	711	721	721	722	737	742	747	749	780	776	775	775	795	803	790	791	Philadelphia
Pittsburgh	470	502	502	492	492	492	497	499	532	529	531	531	531	537	537	537	607	607	607	607	608	610	635	635	654	654	657	660	690	695	688	688	727	727	762	762	791	788	804	819	827	827	827	Pittsburgh
St. Louis	542	542	527	508	524	522	529	552	579	569	585	597	584	587	587	608	628	628	627	648	653	654	655	665	684	687	693	720	728	727	727	756	761	759	760	780	796	796	814	840	849	841	840	St. Louis
San Francisco	490	484	478	478	481	483	486	495	513	519	518	533	525	527	532	565	573	559	557	556	587	600	602	617	631	630	658	676	690	684	693	726	727	722	720	738	763	761	738	798	820	812	814	San Francisco
Seattle	512	512	530	530	530	530	534	548	564	563	586	586	593	592	606	620	635	635	635	635	636	636	644	665	682	676	676	681	693	685	715	720	724	722	736	749	736	747	785	789	799	799	830	Seattle
Montreal	406	408	407	408	396	394	397	397	428	427	445	473	484	484	500	510	512	512	516	516	530	530	516	513	511	542	525	525	532	530	552	560	560	561	560	586	587	591	584	601	603	604	603	Montreal
Toronto																												543	558	554	558	592	592	595	596	611	608	609	607	605	622	638	641		Toronto
U. S. Average	478	478	475	474	480	480	488	507	531	531	540	543	544	548	551	562	587	588	588	594	611	611	614	622	640	643	646	656	673	673	680	692	705	704	709	721	738	738	744	757	773	774	779	U. S. Average

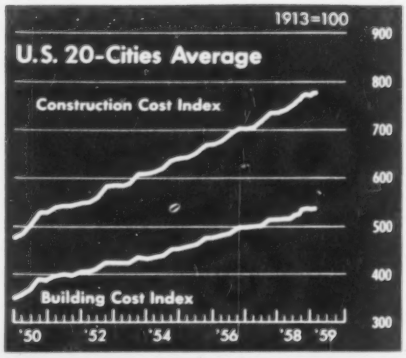
BUILDING COST INDEXES IN 22 CITIES, 1913 = 100

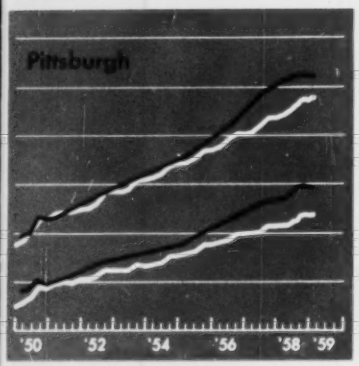
	1948		1949				1950				1951				1952				1953				1954				1955				1956				1957				1958				1959	
	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Feb	
Atlanta	302	308	308	308	309	313	316	316	339	339	339	339	339	351	351	363	364	371	376	376	394	394	392	392	400	400	400	399	417	419	423	424	441	441	442	442	458	456	456	461	472	472	474	Atlanta
Baltimore	375	387	387	349	354	351	354	375	391	387	398	403	398	413	410	414	420	416	414	415	427	428	423	423	434	442	443	441	457	457	472	491	497	498	499	503	518	520	523	527	534	542	543	Baltimore
Birmingham	320	321	326	329	330	319	321	321	328	345	351	351	351	353	355	358	372	372	372	372	390	386	386	386	399	420	423	423	434	442	443	447	456	455	457	457	468	476	477	480	488	493	495	Birmingham
Boston	363	357	357	362	361	372	375	379	396	392	404	407	412	410	411	422	426	425	422	419	433	436	438	438	455	455	458	471	488	487	490	500	508	507	507	518	531	523	522	528	547	542	540	Boston
Chicago	360	353	350	349	352	353	361	381	401	391	401	395	403	413	415	416	432	433	433	443	443	443	445	449	467	468	469	477	488	486	493	500	507	4	504	511	530	528	527	535	560	562	566	Chicago
Cincinnati	374	374	358	356	362	362	360	368	406	392	400	398	395	401	400	406	423	420	420	424	435	434	433	433	444	445	450	456	467	467	464	475	493	491	486	480	507	504	501	503	519	515	515	Cincinnati
Cleveland	352	339	337	332	342	339	356	379	406	388	402	402	399	403	403	419	431	428	430	435	439	438	432	431	438	441	441	451	458	464	480	480	489	508	515	508	509	522	527	524	512	515	527	Cleveland
Dallas	322	322	322	322	316	318	322	323	323	338	362	362	371	371	371	371	382	382	382	387	397	405	402	406	422	426	428	424	446	449	439	439	451	451	451	459	469	469	472					Dallas
Denver	369	365	351	351	359	359	378	395	423	400	426	432	423	425	431	433	452	462	472	434	449	441	441	443	468	467	470	474	485	483	487	488	503	519	523	510	522	522	523	525	539	532	532	Denver
Detroit	358	347	348	336	351	351	357	376	401	400	402	411	410	416	419	424	439	438	438	441	450	446	434	432	447	466	481	490	503	498	505	514	528	527	528	535	545	545	545	543	573	574	574	Detroit
Kansas City	366	367	352	357	357	357	374	390	410	406	406	411	417	417	431	434	446	446	446	452	442	442	416	450	466	466	467	477	494	494	497	497	503	505	503	516	516	517	527	533	535	533	533	Kansas City
Los Angeles	368	356	343	339	336	340	360	380	392	377	403	395	381	398	394	407	415	415	420	421	420	419	428	433	448	472	453	457	483	479	485	491	497	494	494	496	508	513	507	514	527	530	532	Los Angeles
Minneapolis	370	368	361	361	361	363	377	389	406	413	408	421	423	438	438	438	450	454	454	454	459	468	468	471	491	492	492	493	502	502	503	515	526	526	527	530	537	537	537	548	554	553	554	Minneapolis
New Orleans	302	310	325	325	325	325	329	340	346	376	379	377	379	379	379	381	397	397	398	407	416	416	419	422	435	432	431	430	439	439	451	457	462	464	463	467	477	481	478	477	485	494	494	New Orleans
New York	403	395	400	398	397	402	410	439	464	459	466	463	457	462	460	465	487	484	484	483	505	505	500	516	526	528	531	533	548	545	553	556	573	569	578	578	599	593	593	601	622	609	628	New York
Philadelphia	394	391	386	384	384	382	397	415	430	419	440	449	436	461	462	472	477	480	480	479	494	494	493	516	516	521	523	533	535	536	538	548	549	556	560	562	561	561	569	581	569	570		Philadelphia
Pittsburgh	376	384	384	375	375	377	382	387	407	397	400	400	405	416	416	416	427	430	439	440	463	460	463	463	475	475	478	480	508	506	500	500	529	533	541	541	568	568	569	573	593	595	595	Pittsburgh
St. Louis	385	393	386	373	379	377	384	396	411	421	432	436	422	427	429	444	448	447	446	446	457	455	455	457	472	472	483	495	503	502	523	522	527	525	529	538	546	546	552	558	567	563	569	St. Louis
San Francisco	350	347	341	341	341	345	352	361	382	385	377	380	377	379	383	386	403	389	389	380	396	397	399	404	420	441	447	447	468	461	470	476	480	484	485	504	497	506	501	507	533	535		San Francisco
Seattle	328	328	328	328	340	341	344	358	374	374	381	384	383	383	389	389	400	400	400	401	402	402	412	413	419	414	414	418	436	428	439	444	452	450	452	456	467	458	466	479	484	484	493	Seattle
Montreal	314	316	315	316	316	314	317	317	346	345	363	378	385	385	383	393	395	395	399	399	410	430	396	393	391	422	408	405	413	427	429	437	437	438	437	451	452	453	446	449	449	449	449	Montreal
Toronto																												426	436	436	433	450	465	479	462	469	468	471	470	468	469	479	480		Toronto
U. S. Average	357	356	353	349	352	353	360	373	393	391	399	401	400	406	407	413	424	425	425	426	436	433	437	440	454	457	460	465	479	479	483	489	500	500	501	504	516	516	516	521	535	535	537	U. S. Average

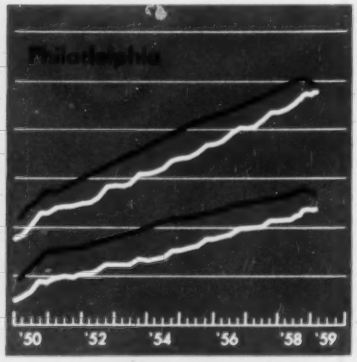


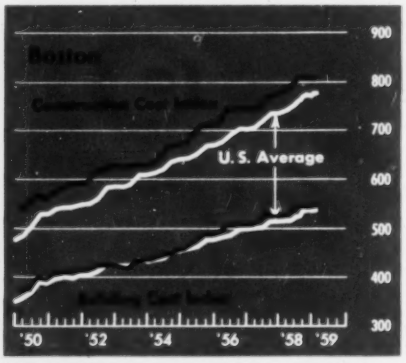
ENR Cost Indexes show how the trends in basic materials prices and labor rates in individual cities vary from the US 20-Cities Averages.

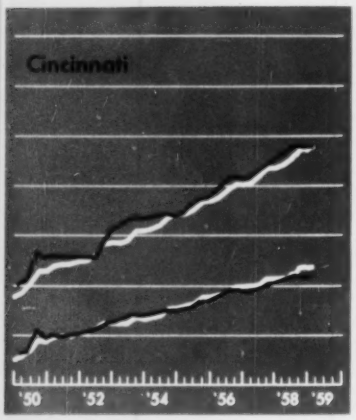
These Indexes are repriced each week. The charts use the official Indexes for the last month of each quarter.

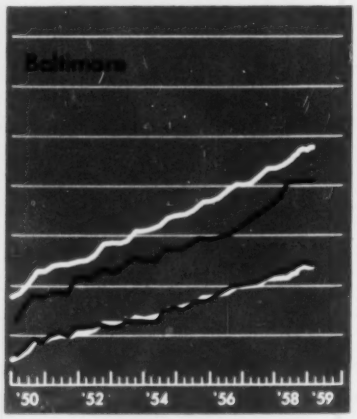


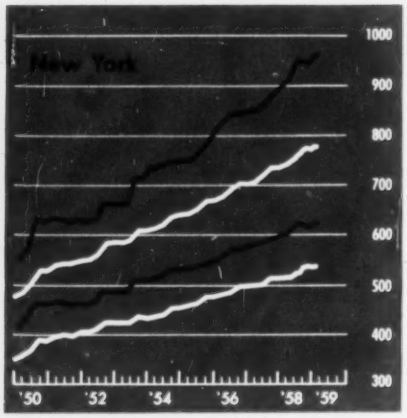


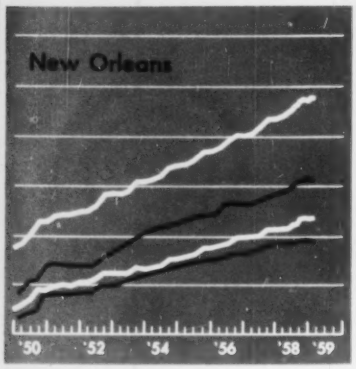


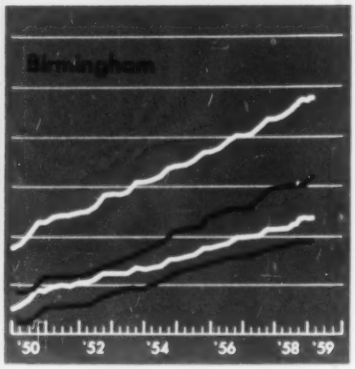


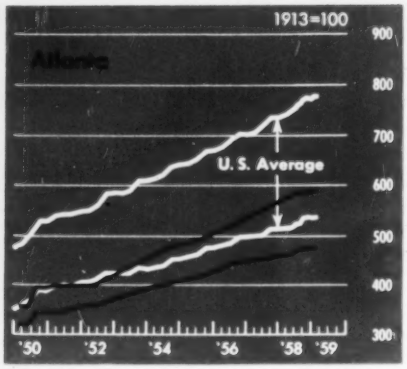




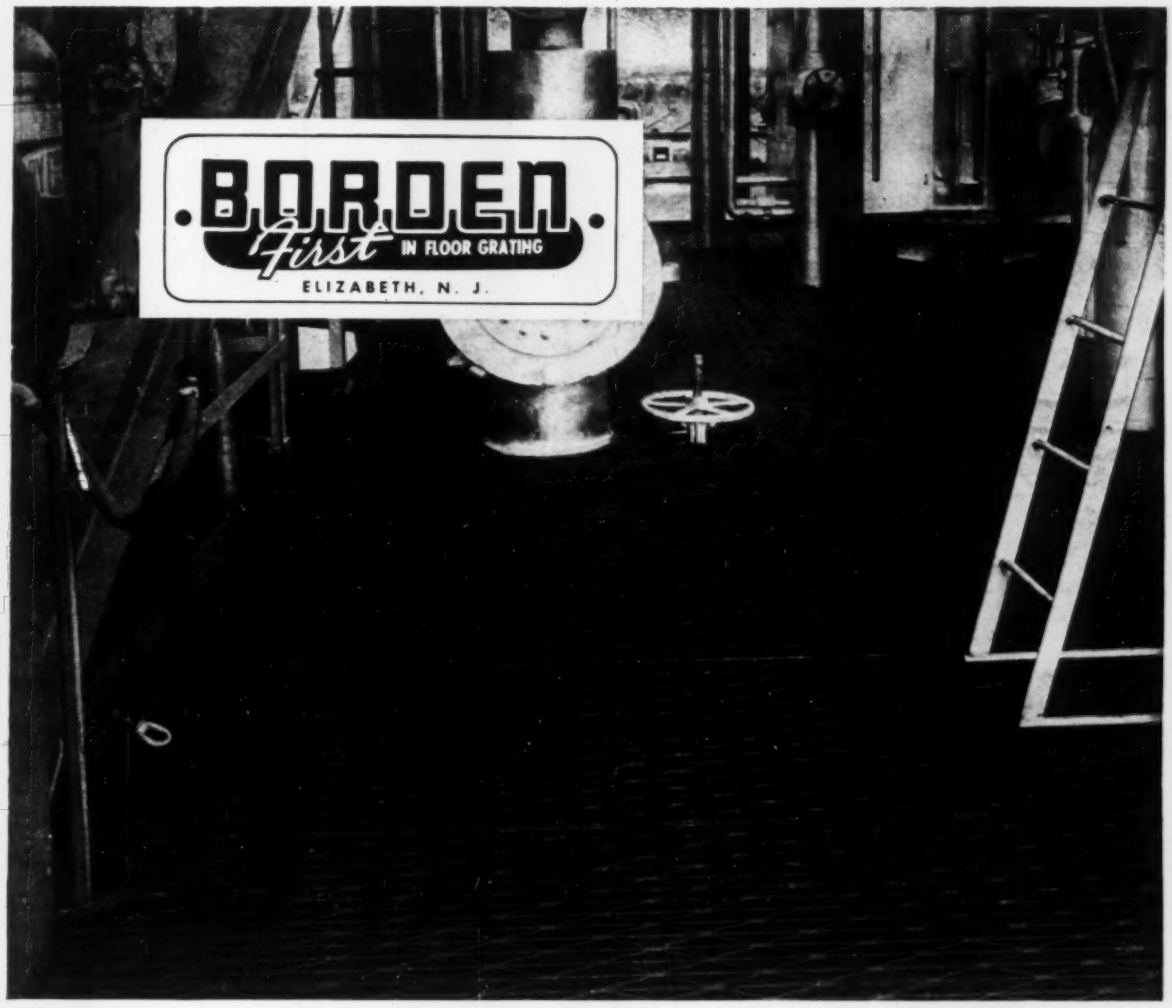








ENR Cost Indexes



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Cost Outlook

Wage and Price Hikes Will

ENR Cost Indexes Show Tenth Consecutive Rise

The charts at right show the upward momentum of this rise is about the same or greater than during the sharp rise of 1956-1958

How much costs rise this year depends on two things . . .

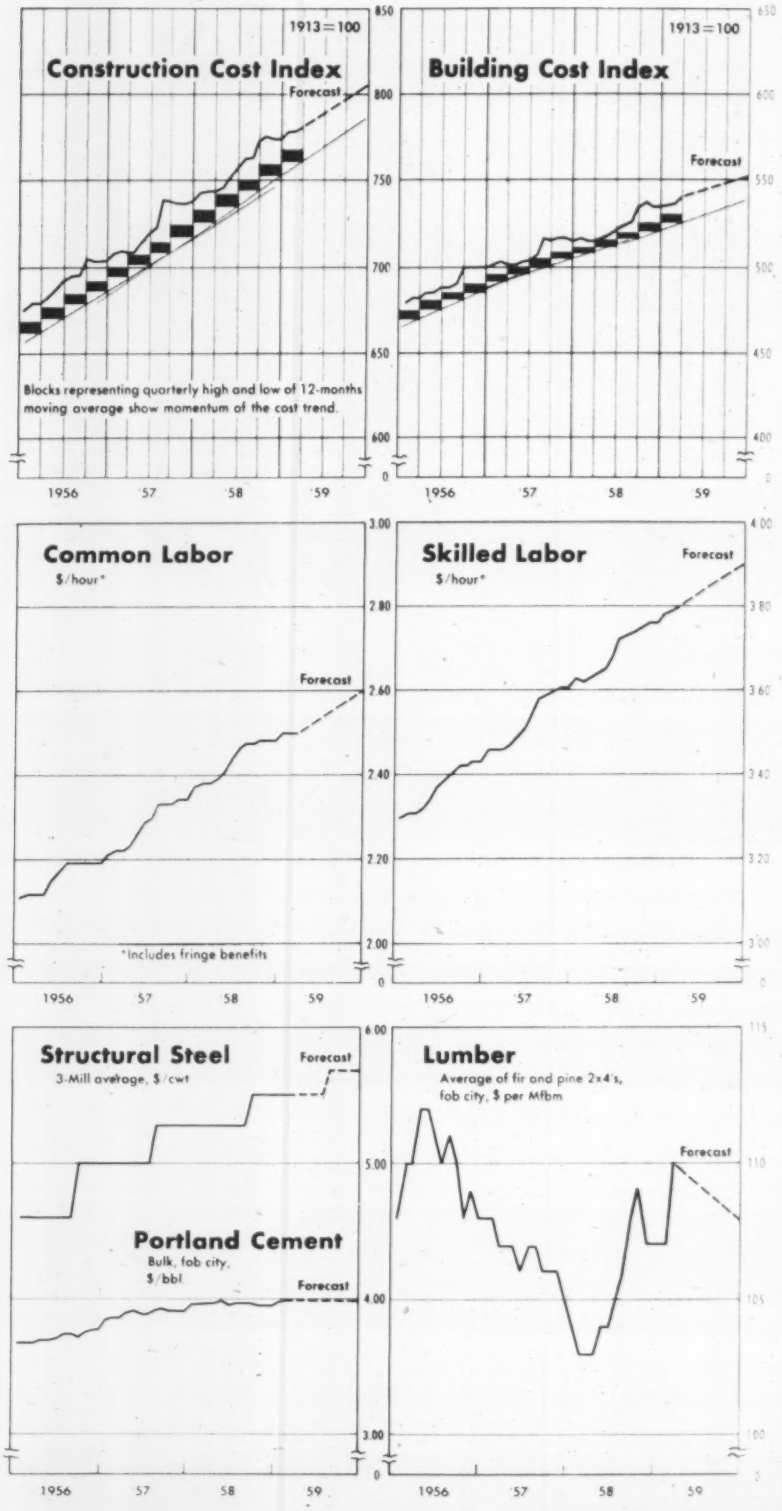
1. How much wages rise when contractors and unions negotiate new contracts this spring.

Many long-term contracts now provide for wage hikes that are almost as big as '58 increases.

2. How much structural steel and lumber prices rise.

Steel prices will go up this summer, but cement prices should hold steady until year's end.

Lumber prices are rising now, but may drop back later.



Push the Cost Trend Up

1st Quarterly Cost Roundup

The tenth annual increase in construction and building costs is in motion. It will gain speed this spring and summer as construction wages rack up their 24th consecutive annual increase and steel prices chalk up their 14th consecutive yearly rise.

Lumber and plywood prices are also rising fast now, but they may turn down later in the year. These tend to rise and recede with the housing market. The trend in interest rates indicates a break ahead in housing demand that could bring lumber prices back down a bit later in the year.

Spurred by these prospective increases in labor and materials costs, ENR's Cost Indexes are expected to continue their rise this year. The ENR Construction Cost Index is headed for 805 by December based on 1913=100. This is 3% over the official monthly value for March, but a rise of 4% for the year.

The ENR Building Cost Index will probably hit 551 by next December, up 2% over the March 1959 value and 3% for the year.

Wage increases will exert the greatest force on this upward push. How much of an increase depends largely upon the results of bargaining sessions between contractors and unions. But for several major cities the 1959 wage pattern has already been set and in most of these cases the increases appear very inflationary (see page 101).

ENR forecasts that by December the 20 cities average of common labor wages, including fringe benefits, will rise to $2.60 per hour. This is 12 cents more than the December 1958 average. The forecast for skilled wages (average of bricklayers, carpenters and structural ironworkers) is $3.91 per hour, including fringes, by December. This would be 14 cents above the December 1958 20 cities average.

These wage increases forecast for 1959 are smaller than the actual rise during the 12 months of 1958. Last year's wage averages for the ENR 20 cities rose 13.8 cents per hour for common labor and 15.2 cents per hour for skilled. But while the predicted increases are smaller for 1959, they will be inflationary. They amount to rises of 4.9% for common labor and 4% for the three skilled trades.

The most effective ways to cancel out the inflationary effects of this continuing wage spiral are elimination of wasteful practices and the continuing development of construction methods designed to reduce man-hours per construction unit.

By June, the construction industry should know better what direct effect 1959 wage increases will have on wage costs this year.

Materials prices will supply less lift than wages to the cost rise this year. Cement prices rose at several northeastern and some far western mills in January. But mills across the country are guaranteeing current prices through the end of December, so no new increases seem likely at local points during the balance of the year. In fact, rail freight reductions scheduled by eastern railroads for April 1 will offset some of the January mill price increase.

By contrast, lumber and plywood prices are rising and construction steel prices will move up at mid-year. ENR expects structural steel shapes to rise by $4 per ton at the mill, which would lift the three-mill average by 20 cents to $5.70 per cwt. This compares with a 22.5 cents per cwt increase in 1958.

Supplies of labor, materials and equipment should be adequate through the year so there's little prospect of special price premiums for scarce items or that slow deliveries will up costs by upsetting construction schedules.

ENR Indexes: How They're Used

The Construction Cost Index was established in 1921 to track the wide fluctuations in prices following World War I. It was carried back to 1913 by months and to 1903 by years.

The Building Cost Index was established in 1938 when common labor wages rose faster than skilled. It uses skilled labor only. The Construction Cost Index uses common labor only.

Both indexes reprice the three major materials, steel, lumber and cement and four construction trades, common labor, bricklayers, carpenters, and structural ironworkers. The weighting of these components in the indexes is:

Components	Construction Cost	Building Cost
Structural Steel, cwt	25	25
Lumber, 2M FBM	1.088	1.088
Cement, bbl	5	5
Common Labor, hr	200	0
Skilled Labor, hr	0	68.38

These indexes measure trends of basic materials and labor costs without correction up or down for low or high productivity of management and labor on the job. In times of low productivity, contractors' selling prices tend to rise faster than the index; when productivity is higher they drop below the index trend. In periods of less extreme changes in productivity, these indexes have a long history of accuracy in predicting degree as well as direction of change in selling prices.

ENR's indexes are used widely to update cost estimates, to establish reproduction costs of structures, to extrapolate special purposes but less frequent indexes and to check bids or estimates.

The materials prices and wage rates used in the indexes are repriced weekly. New values are published in the scoreboard page of ENR. The weekly indexes dated closest to the first day of each month are the official monthly indexes.

Values of both indexes in 20 U. S. and two Canadian cities are published weekly in CONSTRUCTION DAILY. The individual city indexes are charted and tabulated on the insert chart opposite page 68 of this issue. The official monthly values are updated each month in ENR on the Scoreboard page.

Converting ENR Indexes* To Other Base Years

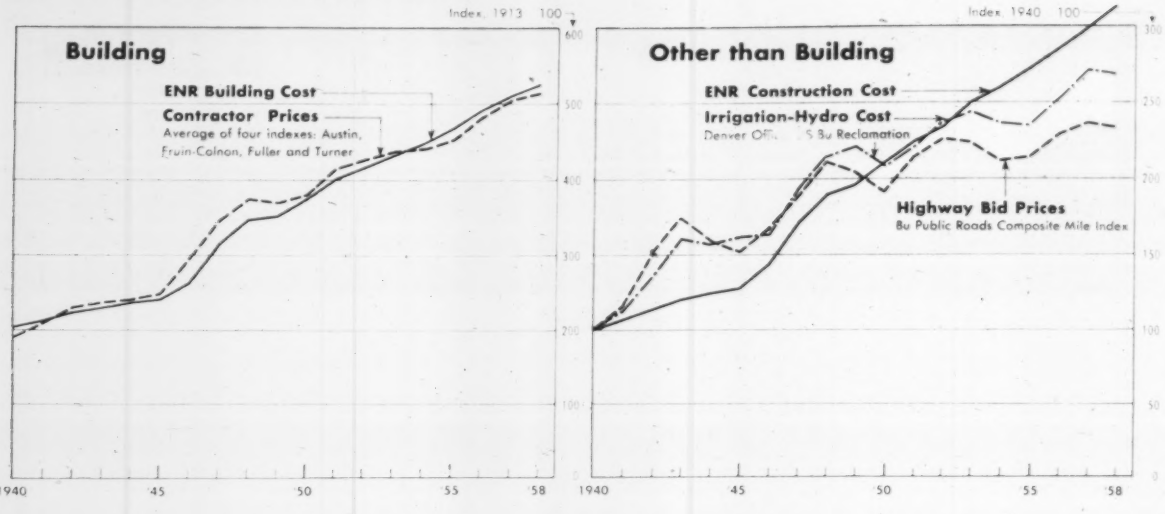
To convert from 1913=100 base to base year below...	Divide 1913=100 values of Construction Cost Index by	Building Cost Index by
1949=100	1.7702	3.5179
1947-49=100	1.5033	3.3642
1940=100	2.4196	2.0281
1939=100	2.3551	1.9744
1926=100	2.0803	1.8196
1925-29=100	2.0695	1.8657
1926-29=100	2.0702	1.8747
1929=100	2.0702	1.9086
1910-14=100	0.9380	
1924=100	2.1536	1.8578
1923-25=100	2.1205	1.8481
1914=100	0.8856	0.9191
1911=100	0.9433	

Conversions to other base years are made by simple ratios:

$I_{n.b.} = \frac{I_{\$}}{I_{o.b.}} \times 100$ where $I_{n.b.}$ is index on new base, $I_{\$}$ is index value on old base, $I_{o.b.}$ is old base index value for new base year

* Applies to 20-cities index, not to individual cities

Cost and Price Indexes



Which Cost Yardstick to Use?

Indexes are the best tools for construction men who must judge direction and degree of cost and price movements accurately.

Some engineers and a number of contractors make up their own indexes, tailored to their experience and special purposes. Others combine and modify indexes computed by someone else to get a composite index for their special purpose. But many, probably most, use cost indexes computed by ENGINEERING NEWS-RECORD or a combination of these general purpose cost indexes and available special purpose cost or price indexes.

Every cost estimate, by its very nature, is a forecast. So the estimator must be skillful not only in using cost and price indexes as bench marks for appraising the current situation, but also in projecting them into the future. These are useful tools, but each is limited in scope by the purpose for which it was created.

These purposes as well as the indexes are shown in the accompanying pages which update this large kit of valuable tools. They are available for special types of construction, for individual cities or areas, by national averages, and to measure cost of labor and material to the contractor or what prices contractors can bid or quote to customers.

The building contractor price indexes lead or lag in relation to the cost index trends of materials and wages. These depend on competitive conditions, overhead, materials supply and delivery predictability, job duration, labor quality and supply and those other concerns of management that result in productivity. The Fuller and Turner price indexes cover industrial, commercial and institutional types of buildings. The Aberthaw, Austin and Fruin-Colnon indexes are designed to measure industrial building prices.

Productivity adjustments are made in other indexes: like American Appraisal, which estimates labor productivity; the E. H. Boeckh indexes, which correct for contractor overhead and profit and estimated changes in productivity; and the Smith, Hinchman & Grylls index, which considers bidding competition, profit margin of bidders, labor efficiency and premiums, taxes, duration of jobs, materials expediting and labor procurement conditions.

• **Timing and availability**—The cost and price indexes shown here vary greatly in timing. Some are weekly, some monthly, others are on quarterly, semi-annual or annual computing schedules. Some come through right on schedule, some lag behind because the bookkeeping takes longer.

The ENR Cost Indexes are repriced each week and the resulting 20-cities average is published on the Scoreboard page in the Business and Finance section. Values for each of the 20 U.S. and two Canadian cities, along with prices of components, are published each Friday in CONSTRUCTION DAILY. They are based on prices wired in the preceding morning.

Where special purpose indexes are needed, but available values are not on a current basis, their values are often extrapolated by using the ENR basic general purpose cost indexes.

• **Special purpose indexes**—In addition to the cost and price indexes already discussed, special purpose indexes are updated here for measuring trends in costs of oil refineries, water utilities, electric and gas plants, railroad way and structures and industrial equipment.

Bid price and cost indexes for heavy construction cover highways, dams, hydro plants, canals and tunnels. The latter indexes cover 17 western states and Alaska.

• **Unit prices**—In the accompanying pages are such dated unit contract prices for schools, public housing, special cost analyses of a variety of buildings and unit prices on heavy construction.

Use This Check List

ENR Cost Indexes	see foldout
Roundup of Building Cost & Price	82
Industrial Building, by cities	86
Composite Cost	86
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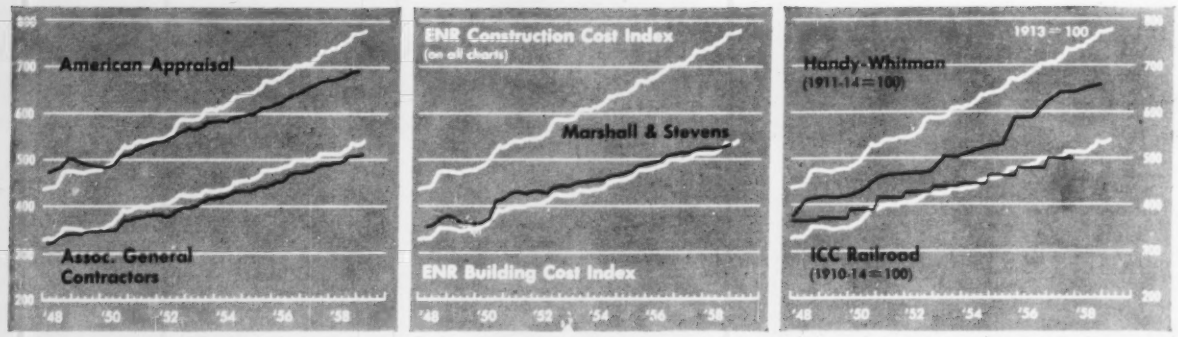
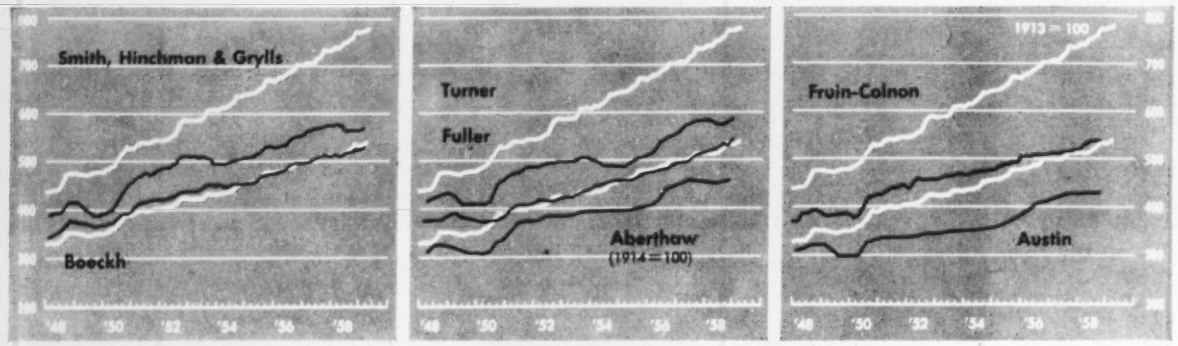
Building Cost & Price Indexes



RISING AGAIN, AFTER LEVELING OFF, the weighted construction cost indexes explain why contractors' selling price indexes are moving up in '59.



WEIGHTED PRICE INDEXES reflect the upturn in basic costs.

BUILDING CONTRACTORS' SELLING PRICES RISE to record highs primarily because of increased labor rates and materials prices.

Price Indexes Rise With Costs

Under pressure of rising wage rates and increasing materials prices, building contractor selling prices have moved up to new record highs.

This climb will continue in the months ahead as construction workers receive the 1959 annual raises, as steel prices advance around midyear and as price tags on other materials are marked up.

While construction and building cost indexes are up anywhere from 2.2% to 5% over a year ago, building contractor selling price indexes have increased from 0.2% to 4.7%. The Boeckh index, which corrects for productivity and overhead, is up 2.7%. The Turner index, which dipped 1% in April and July 1958, reverted in October to its January 1958 high, then went on to set a new high in January 1959, for a 0.6% rise for the year.

The only index below last year's record is the Smith, Hinchman & Grylls, down 1.3%. It also adjusts for productivity. But it is moving up after a five-month lull where it rested at a level 1.9% below its January 1958 high.

Though contractor selling prices are on the upgrade again, they will probably not rise as much as the indexes of basic labor and materials costs. Competition and increased management productivity will offset part of the rise in basic costs. This outlook is limited to 1959. By 1960, the rebound in new building business—industrial, commercial and housing—is expected to get into high gear. Increasing pressures on materials and labor supplies may then limit gains in productivity.

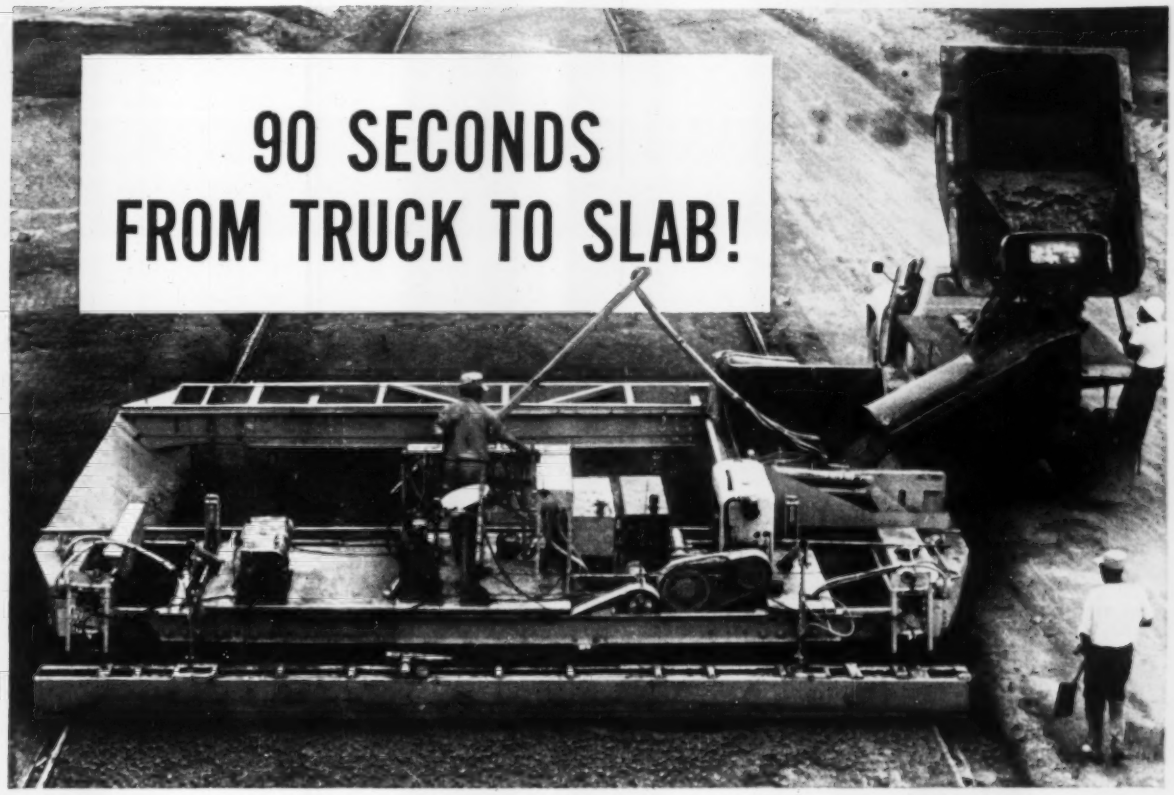
What These Cost and Price Indexes Show

What these contractor price indexes, appraisal and accounting indexes cover is described briefly in the following paragraphs:

• **Aberthaw Co., Boston, Mass.**—Since March 31, 1946, a composite of 36 major cost items in three multi-story and two one-story New England industrial buildings, including all mechanical trades. Repriced quarterly using actual and estimated labor and material costs. Before March 31, 1946, based on New England seven-story and basement, 62 ft 4 in. x 202 ft 4 in., reinforced concrete building built in 1914. Quarterly through December, 1956; semi-annual beginning 1957.

• **American Appraisal Co., Milwaukee, Wis.**—Index is based on detailed analysis of materials and labor required for four types of industrial building structures (frame, brick, concrete, and steel) in 30 representative cities. The 30 cities average is used here. The index corrects for labor productivity. See p. 86 for more details.

• **Associated General Contractors of America (AGC), Washington, D. C.**—Wages and materials for 12 cities combined in 40-60 ratio. Wages are prevailing rates for hod carriers and common labor. Materials are weighted: sand, gravel, and crushed stone, 1; cement, 1; lumber, 1; hollow tile, ½; structural and reinforcing steel, ½. Monthly. (Cont. on p. 82)



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60 seconds to chute-load the spreader bucket with the fast, flexible Dumpcrete hauling body—15 seconds to spread—15 seconds to move and strike off. Only 90 seconds completes the cycle. Placing rate ranges from 180 to 260 cu. yds. per hour, depending on plant capacity.

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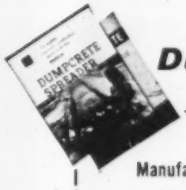
Send for this new  ***Dumpcrete Literature***

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FIRM _____
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CITY _____ ZONE ____ STATE _____

These 14 indexes show . . .

Cost Trends by Type of Building

	Weighted Cost Indexes						Contractor Price Indexes						
	General Construction		Industrial		Comm'l & Factory	Office & Station	Rein. Concrete, Pacific	General Bldg.		Industrial			General Building
Yr. & Month	ENR Constr. Cost	Assoc. Gen. Contr.	American Appraisal Co.	Marshall & Stevens	E. H. Boeckh	ICC Railroad	Handy-Whitman	ENR Bldg. Cost	Smith Hinchman & Grylls	Aber-thaw	Austin	Fruin-Colnon	Fuller	Turner
					c	i	k		a,f	bd	f		g	g
1913	100	100	100	100	100			100			100	100	100	100
1926	208	197	217	185	181	184	191	185	185	197	185	218	202	165
1932	137	171	155	130	144	141	145	141	128	168	117	178	157	136
1939	236	188	200	183	191	166	192	197	199	190	152	208	195	182
1945	308	231	271	248	252	244	248	239	285	236	234	247	241	258
1946	346	257	322	288	275	291	251	262	319	279	273	285	290	318
1947	413	296	430	338	323	333	328	313	371	304	301	347	354	382
1948	463	332	490	368	365	364	374	345	405	321	317	382	380	424
1949	477	342	490	365	369	368	416	352	395	312	307	382	382	413
1950	510	357	500	390	368	390	420	375	426	321	313	398	377	427
1951	543	377	532	430	415	412	458	401	476	370	337	433	405	478
1952	569	388	553	436	430	426	466	416	499	381	342	449	416	493
1953	600	408	577	448	445	438	477	431	504	388	347	460	429	500
1954	628	426	592	459	450	442	501	446	500	394	352	469	450	484
1955	660	439	608	479	465	460	524	469	522	398	366	484	462	498
1956	692	462	635	503	489	480	588	491	544	427	400	503	482	544
1957	724	484	663	515	507	500	634	509	568	458	420	512	504	576
1958	750	499	682	528	517	...	650	525	565	453	...	530	526	577
Jan	733	493	673	.	513	...	644	517	574	...	...	517	519	580
Feb	744	493	673	.	512	...	...	516	572	...	...	517	...	...
Mar	744	493	674	524	511	...	...	516	570	...	426	517	...	...
Apr	746	494	675	.	512	...	...	517	572	...	...	518	521	573
May	752	498	677	.	513	...	...	518	564	...	...	531	...	...
Jun	752	498	680	523	517	...	...	521	561	448	427	531	...	...
Jul	763	502	683	.	519	...	655	524	561	...	...	537	531	573
Aug	764	503	683	.	520	...	...	526	561	...	...	537	...	...
Sep	773	504	690	530	521	...	...	535	562	...	427	538	...	...
Oct	775	504	691	.	523	...	...	537	562	...	...	538	531	580
Nov	774	504	691	.	524	...	...	535	562	...	...	538	...	...
Dec	774	504	402	535	524	...	...	535	562	457	427	538	...	...
1959														
Jan	778	505	693	.	527	...	660	536	566	...	...	...	540	584
Feb	779	506	...	.	...	...	...	537	568	...	...	...	...	...
Mar	781	...	...	...	...	...	...	540	...	...	...	...	...	...

•a Includes adjustment for estimated changes in productivity contractor overhead, profit and adjustment for estimated changes in productivity •b 1914 = 100 •c Incl •d Semi-annual since Sep. '56; quarterly before •e Reported on 1926 29 base •f Reported on 1926 base •g Reported on 1939 base •h 1911 14 = 100 •i 1910 14 = 100

(Continued from p. 80)

• **Austin Co., Cleveland, Ohio.**—Reprices typical one-story, steel frame, monitor-type industrial building. Includes concrete foundations, brick curtain walls, continuous steel sash, concrete floor laid on ground, 2 in. wood roof deck on timber purlins covered with four-ply waterproofing, monitor sash with mechanical operators, but no heating, lighting, plumbing, sprinkler, or other services. Priced for central and eastern states. Quarterly.

• **E. H. Boeckh & Associates, Inc., Washington, D. C.**—20 cities average for five commercial and factory buildings price indexes used here. See page 88 for values for 10 classes of buildings in 21 of the 47 U. S. cities covered. Calculated by actual survey at source of materials prices paid by contractors and current labor rates (certain corrections being made in some areas for labor efficiency or shortage). Index includes construction overhead, sales taxes, compensation insurance, social security and contractor's profit. Indexes are primarily engineered to use as local cost conversion factors to construction cost data released by Boeckh. Complete formula as published in "Boeckh's Index Calculator Table."

• **Fruin-Colnon Contracting Co., St. Louis, Mo.**—Five industrial buildings in St. Louis re-priced on basis of contractor's actual and estimated material and labor costs. Monthly.

• **George A. Fuller Co., New York, N. Y.**—Based on price movements of all materials and labor needed to construct four typical buildings: two in commerce, one in industry, and one purely monumental, modified through the years to include all modern innovations of engineering and architecture, such as high-speed elevators, modern lighting, cantilever constructions, lightweight aggregates, etc. Re-priced quarterly on basis of company's experience.

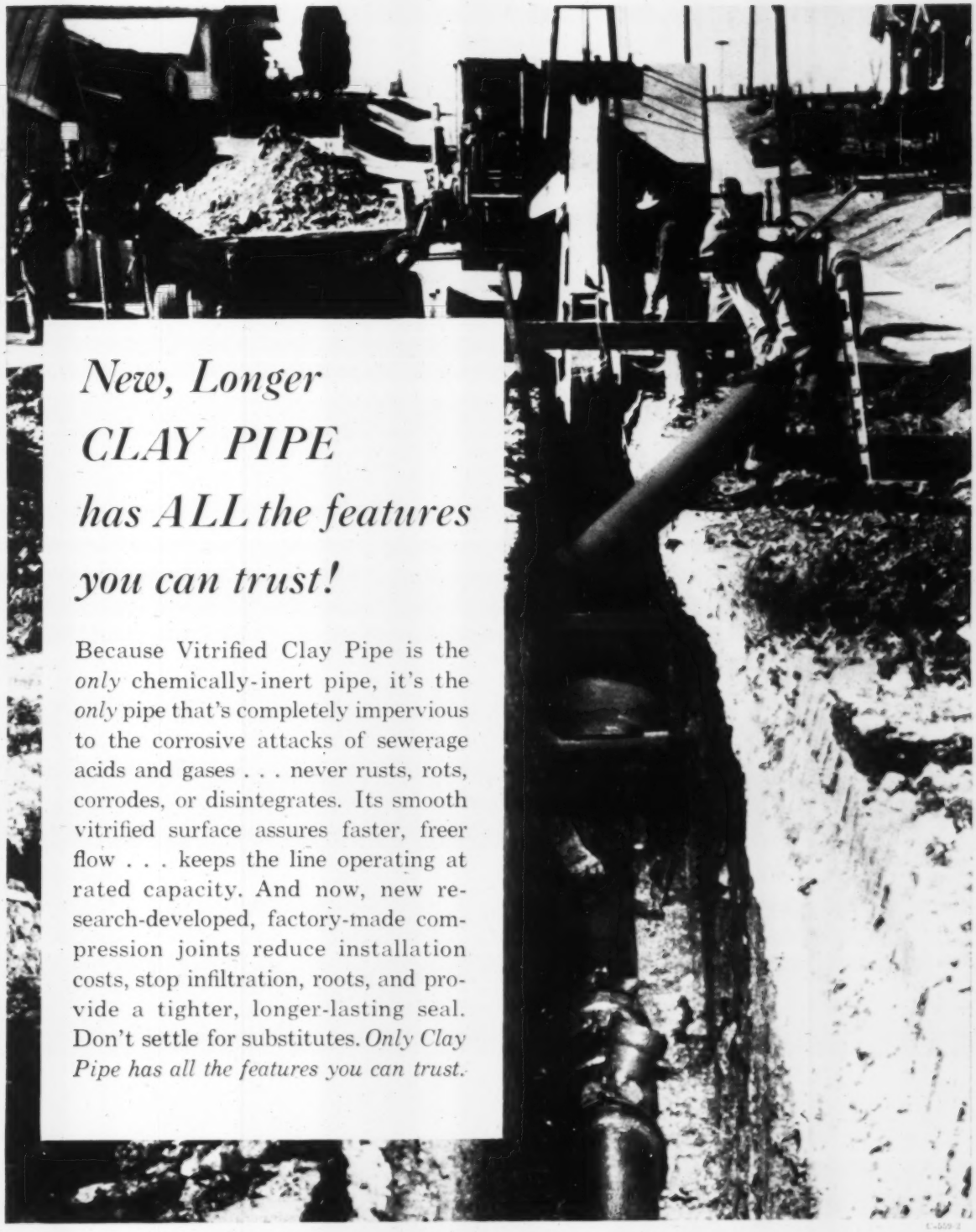
• **Marshall and Stevens, Inc. of Illinois, Chicago, Ill.**—A national average with a system of modifiers to get regional and municipal values for each of four types of building: A—Fireproof, protected steel; B—Fireproof, reinforced concrete; C—Masonry buildings; D—Frame. They are designed to reflect normal costs in line with recognized or published prices of building materials, equipment, and labor. Extraordinary or intangible conditions are not included. Quarterly and annual for **ENR**.

• **Smith Hinchman & Grylls, Inc., Detroit, Mich.**—Actual in-place costs, using building materials costs, freight rates, skilled and unskilled labor rates and including labor efficiency and premiums, bidding competition, contractor profit margins and overhead. Figured with the contractor overhead are taxes, duration of projects, material expediting, and labor procurement. Monthly.

• **Turner Construction Co., New York, N. Y.**—Eastern cities. Own cost experience on labor rates, material prices, productivity of labor, efficiency of plant and management, competitive conditions, forecast of price trends. Quarterly and special as needed.

• **Railroad Construction Cost Indexes ICC, Washington, D. C.**—Stations and office building series used here. See page 94 for definition of this Interstate Commerce Commission analysis of major contracts. Annual.

• **Handy-Whitman, Whitman, Requardt & Associates, Inc., Baltimore.**—Reinforced concrete building in the Pacific Division series used here. See page 91 for definition and selected values for seven of 105 construction cost elements. Semi-annual.



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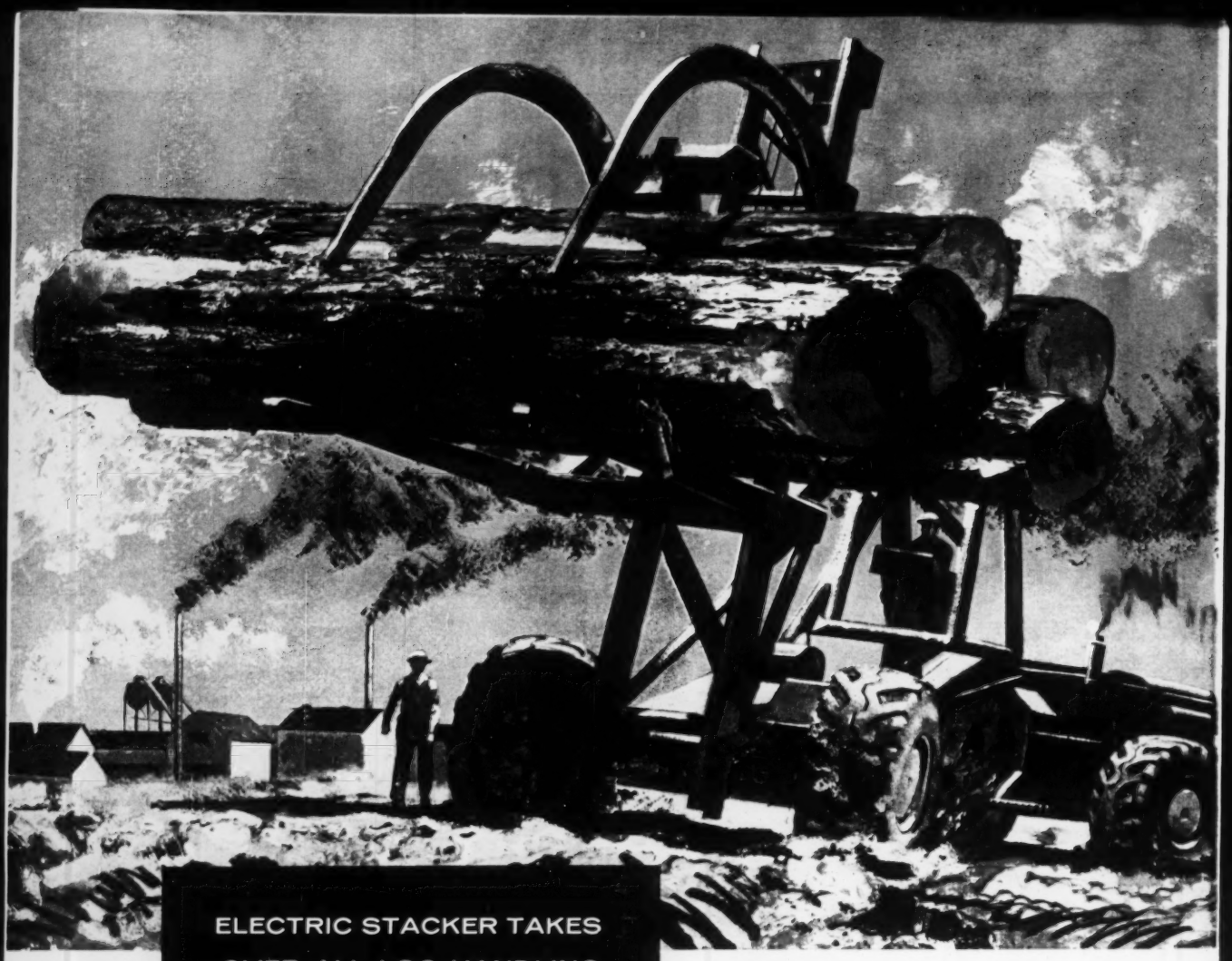

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Millyard costs are being sharply reduced by this giant fork truck built by R. G. LeTourneau, Inc. – the versatile Electric Log Stacker. 25- to 50-ton truck loads are *unloaded in a single bite!*

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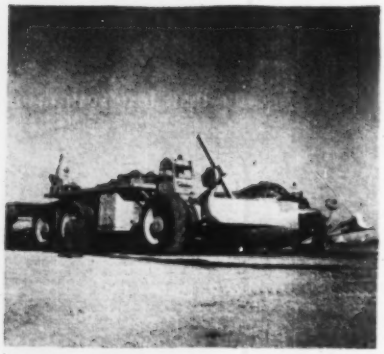

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In the Electric Wheel, a high-torque DC electric gear-motor is mounted inside the rim of each wheel, eliminating the power losses of mechanical or hydraulic power-transfer systems. A diesel-electric generator supplies power to the wheels, all of which drive. Aiding traction and smooth operation is the *automatic* transfer of power to the wheels with best footing, and an infinite range of power control from zero to full speed.

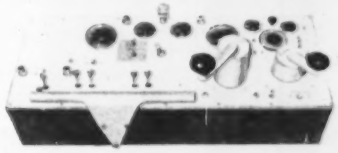
The Electric Wheel is just one part of this proven system of diesel-electric power and control. Steering, braking, other work functions, are all electric powered by thoroughly tested components, *all of which we make ourselves.* This assures dependable performance and allows new freedom to design *machines to do the job you want done.*

Now in Earthmoving

A number of new earthmoving machines with all-wheel electric drive — one type shown below — have now been built for the BIG jobs in construction and mining. For information please write 2395 South MacArthur, Longview, Texas.

electrically powered at the point of action – and controlled by simple fingertip switches – this agile giant and its single operator have replaced *five men and three machines* in the average millyard. Case histories showing the reduction in operating costs are available on request.

Similar increased productivity is now available to earthmoving and mining contractors, too.



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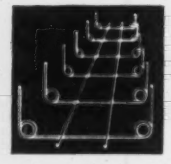

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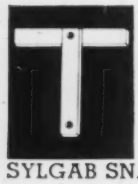

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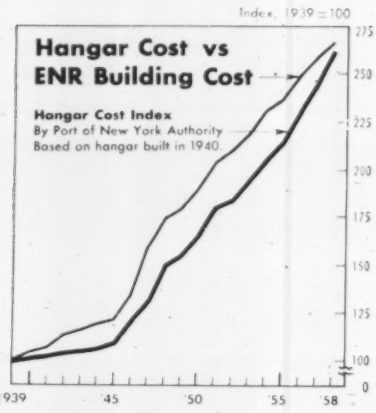


HANGAR COSTS ARE UP in New York, following the ENR Building Cost Trend.

Hangar Cost Index

Port of New York Authority 1939 = 100

Year	Hangar Cost*	ENR Bldg. Cost	Year	Hangar Cost	ENR Bldg. Cost
1939	100.0	100.0	1949	155.2	178.2
1940	101.3	102.7	1950	165.5	190.1
1941	102.0	102.1	1951	179.0	202.9
1942	103.9	112.6	1952	184.3	210.5
1943	105.1	115.9	1953	194.1	218.2
1944	106.1	118.9	1954	206.2	230.8
1945	*106.1	121.1	1955	213.8	237.5
1946	121.1	132.9	1956	231.1	248.6
1947	132.2	158.5	1957	245.3	257.6
1948	149.8	174.5	1958	262.3	265.7

* Hangar built in 1940

Composite Index Weights Costs by Volume of Work

The U. S. Dept. of Commerce Composite Cost Index weights special purpose and general construction cost and price indexes by estimated dollar volume of construction put in place.

On some types of work, two indexes are used, one special purpose for deflating, the other, available monthly, for interpolating for the months between the less frequent and timely values of special purpose indexes.

By classes of construction the indexes used are: residential, Boeckh; industrial building, Turner & Boeckh; warehouses, office and loft buildings, Fuller & Boeckh; other private and public buildings, American Appraisal; farm dwellings, Bu of Agriculture Economics & Boeckh; farm service buildings, BAE & Amer Appr; railroad, ICCRR & ENR Construction; telephone & telegraph, ICCT&T & ENRC; electric and gas utilities, Handy-Whitman & ENRC; petroleum pipeline, HW & ENRC, ICC & ENRC; all other private, aver ENRC & Assoc. General Contractors. Military and Naval, aver of Amer Appr, Bu of Public Roads, ENRC, Fuller & Boeckh, Turner & Boeckh; highway, BuPR & ENRC; sewer & water, aver AGC & ENRC; misc public service, aver HW & ENRC; conservation & development and all other, aver of AGC & ENRC.

Monthly dollar volume estimates for each type of construction are deflated by the appropriate indexes. The sum of all deflated segments is divided into the estimated total of all types of construction in current dollars to compute the values of the Composite Construction Cost Index.

Composite Cost Index

Bldg. Materials & Constr. Div., U. S. Dept. of Commerce, 1947-49 = 100

By years			By months								
			1949	1952	1953	1954	1955	1956	1957	1958
'34	48	Yr	103	119	122	122	125	132	137	138
'35	47									
'36	48	J	106	117	121	121	122	128	134	137
'37	51	F	105	117	121	121	122	129	135	137
'38	52	M	105	117	121	121	123	129	135	137
'39	49	A	104	117	121	120	123	130	135	138
'40	50	M	103	118	121	121	124	131	137	138
'41	54	J	103	119	122	121	125	132	137	139
'42	61									
'43	65	J	102	120	123	122	125	133	138	139
		A	101	121	123	122	126	133	138	139
'44	64	S	101	121	123	122	126	133	138	139
'45	67									
'46	77	O	102	121	122	123	127	133	138	139
'47	93	N	102	121	122	122	127	134	138	139
'48	104	D	101	120	122	122	127	134	137*	140

* Revised Jan. '59 is 139

Industrial Building Cost

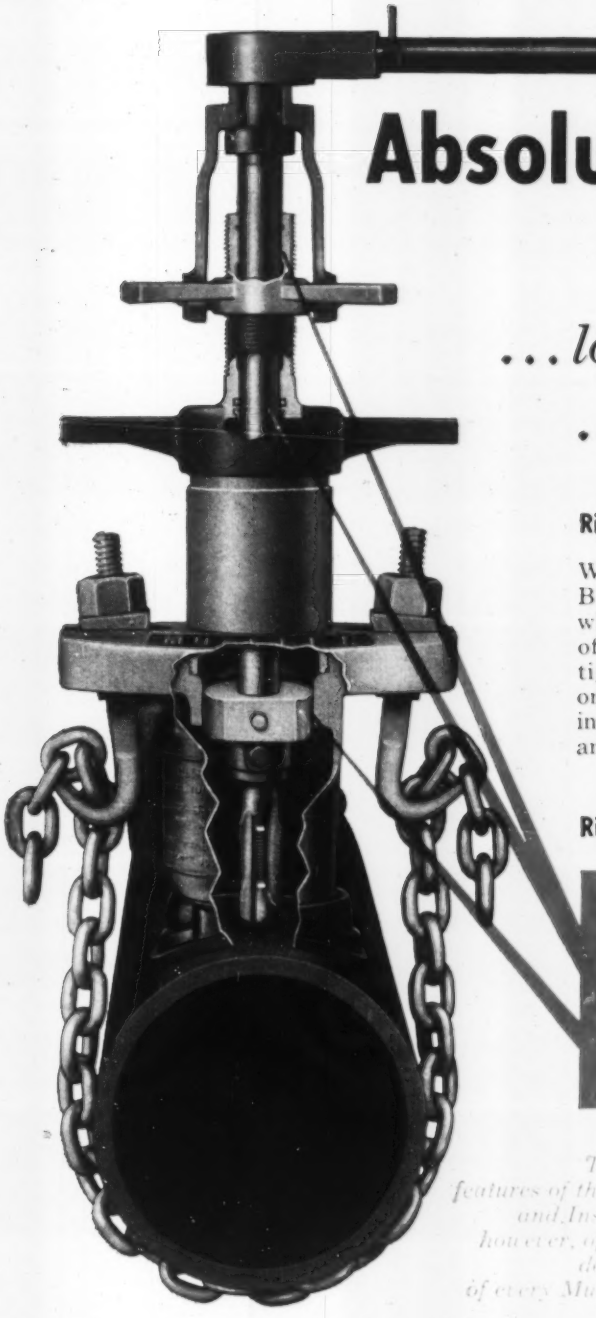
The American Appraisal Company's cost index is based on detailed analysis of materials and labor required for four types of industrial building structure (frame, brick, concrete, and steel) in 30 representative cities. It is re-priced monthly in accordance with prevailing wage scales and labor performance for the various building trades and quotations for construction materials in 30 key cities in the United States. The index corrects for labor productivity but assumes "normal average conditions and does not give any recognition to overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. See table below for indexes in 22 of the 30 cities covered.

Building Cost Index

American Appraisal Co., Milwaukee, Wis., 1913 = 100

30-cities Average and 22 individual cities.

	'26	'32	'39	'42	'45	'49	'56	'57	'58	Jan '59
U. S. Aver., for 30 cities	217	155	200	241	271	490	635	663	682	693
Boston	224	160	210	248	270	485	644	679	706	725
New York	233	170	219	248	272	503	666	706	735	753
Buffalo	219	157	205	247	270	506	661	705	724	742
Baltimore	224	166	198	248	277	510	638	664	692	699
Philadelphia	225	161	196	247	275	483	625	650	671	675
Pittsburgh	236	172	219	249	279	486	619	648	665	681
Cincinnati	217	157	209	242	272	477	609	648	666	675
Cleveland	233	160	206	245	268	485	640	675	681	684
Chicago	219	162	205	235	260	452	595	614	626	631
Indianapolis	219	157	206	247	276	501	641	669	691	697
Detroit	224	148	208	252	278	500	665	704	725	737
Milwaukee	215	144	209	254	280	493	676	701	710	719
Minneapolis	197	148	202	235	266	453	629	635	648	654
Kansas City	220	156	209	230	268	469	586	603	622	629
St. Louis	230	163	208	238	265	478	634	653	669	672
Atlanta	211	147	186	240	278	514	665	715	742	756
Dallas	204	146	171	209	246	455	563	593	602	620
New Orleans	217	145	194	241	277	501	637	674	687	709
Denver	204	149	195	229	245	441	565	575	598	606
Seattle	199	141	196	244	277	509	632	645	654	669
San Francisco	188	144	183	225	244	446	566	614	631	641
Los Angeles	195	141	167	213	249	475	621	631	649	663



Absolute Rigidity Means

...longer tool life

...perfect connections

Rigidity on the main . . .

Widely spread chain hook washers of the new B-100 are deeply recessed in yoke—cannot slip off when used on large diameter pipe. Unique design of chain hook keeps chain from twisting while tightening. They all add up to absolute rigidity on the main—machine cannot move during drilling, tapping or inserting operations. Broken tools and leaky connections are eliminated.

Rigidity in the boring bar . . .

Three widely spaced boring bar bearings, two in the feed sleeve and one at extreme bottom of boring bar, assure perfect boring bar alignment. Molded nylon lower bearing supports drill when it first contacts the main. Pipe curvature cannot deflect drill—tools give longer effective life. These three boring bar bearings guarantee perfect centering of tool and stop, assuring a pressure-tight connection.

These are only a few of the many advanced features of the new Mueller B-100 Drilling, Tapping and Inserting Machine. They are typical, however, of the attention to detail in research, design and engineering that become a part of every Mueller product used by the water industry.

MUELLER®
B-100 Machine

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

Cost Indexes for 10 Types of Buildings

By E. H. Boeckh & Assoc., Inc., Washington, D. C. U.S. Average 1926-'29 100

Annual Averages By Cities	Residences Frame	Residences Brick	Apartments, Hotels, Office Bldgs. Brick and Wood	Apartments, Hotels, Office Bldgs. Brick and Conc.	Apartments, Hotels, Office Bldgs. Brick and Steel	Commercial & Factory Bldgs. Frame	Commercial & Factory Bldgs. Steel	Commercial & Factory Bldgs. Brick and Wood	Commercial & Factory Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Conc
U. S. Average										
1926-29	101.4	102.5	102.5	102.8	101.3	102.2	100.8	101.7	102.2	104.6
1939	101.2	104.4	104.1	111.2	109.4	101.3	110.4	105.0	112.1	113.3
1946	161.8	161.9	161.7	154.0	154.8	165.6	145.0	158.7	154.8	156.0
1949	213.8	215.6	215.0	208.1	208.4	218.4	195.5	211.9	208.7	211.4
1957	273.1	281.4	281.0	287.7	282.2	277.8	283.8	280.9	296.6	297.1
1958	274.9	284.5	283.9	294.9	286.4	279.8	291.1	284.5	304.8	306.0
Jan. 1959	279.1	289.2	288.5	301.1	291.9	284.5	295.9	288.9	310.7	312.8
Atlanta Area										
1926-29	87.2	87.0	84.2	83.7	87.0	82.9	93.5	84.7	87.5	86.8
1939	82.8	86.0	86.1	95.1	95.0	80.6	96.2	88.9	94.6	97.4
1946	139.2	148.1	148.2	136.8	139.9	151.7	130.0	146.8	135.1	136.4
1949	186.9	189.3	189.3	180.6	185.4	191.7	172.7	186.5	177.5	180.8
1957	239.0	241.2	241.4	248.7	250.3	242.2	252.6	239.7	254.7	252.1
1958	239.8	243.9	243.8	253.7	253.7	243.2	264.5	243.6	262.0	261.9
Jan. 1959	243.2	247.7	247.7	261.8	259.2	247.1	269.5	247.4	268.3	268.4
Baltimore Area										
1926-29	107.2	112.0	107.6	100.6	100.7	106.3	95.5	109.8	96.8	101.2
1939	93.5	95.5	95.6	99.3	99.2	93.0	101.2	96.6	101.4	100.2
1946	163.1	161.7	162.2	139.3	150.8	167.6	138.9	158.8	150.0	148.2
1949	216.1	217.4	217.3	203.5	203.8	220.5	191.8	216.6	203.6	208.5
1957	270.2	274.4	275.2	273.4	271.9	275.3	275.5	272.6	283.6	280.0
1958	272.1	277.8	278.3	281.6	277.3	277.2	284.4	276.2	293.0	290.1
Jan. 1959	274.1	280.3	281.2	285.2	280.6	279.0	286.5	279.5	296.1	294.1
Birmingham Area										
1926-29	91.7	90.7	91.1	95.5	96.8	90.2	97.5	94.6	96.3	96.3
1939	87.8	90.9	91.5	96.1	96.2	84.9	96.9	95.1	95.6	96.3
1946	149.3	147.4	147.9	137.3	139.4	149.7	128.1	145.4	135.2	137.4
1949	188.2	187.2	187.6	178.9	182.0	192.8	172.6	183.7	177.7	180.0
1957	237.9	243.0	243.9	246.8	247.2	239.4	250.7	245.5	253.0	252.3
1958	240.2	246.6	247.3	254.5	251.4	242.3	255.5	249.9	261.9	262.4
Jan. 1959	245.5	252.8	253.0	262.3	257.5	248.2	262.6	255.7	268.1	271.4
Boston Area										
1926-29	116.3	120.3	115.4	106.2	107.0	118.8	106.3	112.5	108.7	105.8
1939	106.2	110.4	110.1	116.3	113.7	105.7	114.2	111.5	118.2	118.5
1946	167.0	166.5	166.0	156.8	156.6	172.4	147.1	161.1	158.5	160.4
1949	223.0	226.5	225.9	216.7	215.6	227.1	201.3	222.9	218.2	221.9
1957	283.9	293.2	293.4	298.7	293.1	288.7	296.4	292.9	311.7	308.4
1958	284.2	294.7	294.8	302.8	294.7	289.0	301.7	294.3	317.0	314.1
Jan. 1959	287.3	298.1	298.0	307.3	298.2	292.1	304.5	298.2	320.1	319.6
Chicago Area										
1926-29	109.2	111.2	109.8	113.2	109.1	112.9	105.2	105.9	112.0	116.0
1939	110.6	112.5	111.1	123.6	118.7	114.2	117.6	109.3	122.6	127.6
1946	168.3	169.0	168.2	158.9	156.9	168.1	143.5	152.4	157.0	162.5
1949	219.2	218.3	216.1	210.6	208.7	229.1	193.3	202.7	210.4	215.1
1957	284.1	288.9	286.5	298.6	289.3	296.1	288.0	278.1	305.8	310.9
1958	284.9	290.1	287.9	304.1	293.1	297.3	294.9	279.7	312.4	316.7
Jan. 1959	287.8	292.5	290.3	307.5	296.9	300.6	296.2	282.1	315.8	319.7
Cincinnati Area										
1926-29	100.5	105.0	101.3	101.0	100.2	100.2	99.6	103.1	100.6	101.0
1939	103.3	106.2	105.9	113.9	110.1	103.3	111.2	107.1	113.7	116.5
1946	165.6	166.8	166.7	154.5	154.7	167.5	140.7	166.1	154.1	156.1
1949	214.1	216.6	215.8	207.5	206.0	217.9	193.5	214.1	208.4	212.2
1957	272.8	283.3	282.2	290.6	281.5	277.1	283.8	285.4	299.3	302.4
1958	273.8	285.9	284.7	296.3	284.9	278.4	290.8	287.9	306.8	309.5
Jan. 1959	277.5	289.8	288.7	300.8	289.6	282.5	296.1	291.1	312.3	314.0
Cleveland Area										
1926-29	107.2	113.4	108.5	111.3	108.3	109.0	103.0	107.2	110.5	111.8
1939	106.2	109.6	109.5	119.5	112.8	107.5	112.9	109.5	117.7	118.0
1946	169.2	169.4	168.7	160.2	159.9	174.1	146.4	164.3	161.0	165.9
1949	224.5	225.7	222.6	216.0	214.0	233.0	198.5	218.5	217.2	220.9
1957	293.9	305.0	302.6	311.0	298.5	302.3	294.6	302.5	320.2	325.1
1958	294.2	306.5	304.5	316.0	301.8	302.3	301.7	305.1	327.0	331.2
Jan. 1959	298.9	311.0	308.8	321.6	306.7	308.0	308.3	308.6	333.5	337.4
Dallas Area										
1926-29	103.1	107.3	103.2	98.9	99.1	103.6	100.5	100.9	99.4	99.7
1939	95.1	95.8	96.7	98.8	100.2	94.8	106.6	96.0	101.9	98.9
1946	150.2	148.8	149.4	139.8	143.4	153.5	140.3	144.6	142.6	141.1
1949	207.2	206.2	206.9	197.1	201.3	210.3	197.1	203.2	201.5	195.4
1957	255.2	263.7	265.5	263.4	264.2	258.4	274.7	267.1	274.8	265.6
1958	257.7	264.2	266.0	266.3	265.0	257.7	276.8	268.6	278.0	269.5
Jan. 1959	261.2	268.4	270.2	271.0	269.8	261.0	280.0	273.6	282.5	274.5
Denver Area										
1926-29	95.0	99.7	95.5	102.4	99.6	95.5	105.5	94.6	101.4	108.0
1939	112.1	112.0	111.2	116.1	114.4	114.8	118.7	109.5	117.0	117.8
1946	160.1	160.3	159.4	155.3	157.9	164.0	155.6	156.5	160.0	158.3
1949	212.9	215.8	215.9	211.0	213.1	216.2	207.0	214.3	214.6	215.3
1957	272.1	281.3	281.5	285.4	282.8	274.1	289.1	284.7	296.4	293.1
1958	272.0	282.2	282.3	288.1	283.2	273.5	290.3	286.8	298.8	295.9
Jan. 1959	274.6	284.5	284.5	290.6	285.6	276.2	289.6	288.8	300.0	297.9
Detroit Area										
1926-29	103.3	108.4	104.2	102.9	102.4	103.7	103.1	103.5	103.3	104.4
1939	98.8	102.7	102.9	108.6	107.5	98.7	108.8	104.2	111.4	110.1
1946	165.9	165.9	166.8	157.4	157.9	171.3	147.5	160.9	160.0	159.7
1949	221.0	222.6	221.9	212.2	211.5	227.0	196.8	216.8	214.2	215.9
1957	288.2	297.8	296.6	303.5	293.4	295.4	292.8	295.7	313.6	315.5
1958	291.0	303.2	301.7	312.2	298.5	297.5	299.9	302.9	323.2	326.6
Jan. 1959	294.9	307.5	306.1	318.4	303.9	301.7	304.6	307.4	329.2	333.9

Annual Averages By Cities	Residences Frame	Residences Brick	Apartments, Hotels, Office Bldgs. Brick and Wood	Apartments, Hotels, Office Bldgs. Brick and Conc.	Apartments, Hotels, Office Bldgs. Brick and Steel	Commercial & Factory Bldgs. Frame	Commercial & Factory Bldgs. Steel	Commercial & Factory Bldgs. Brick and Wood	Commercial & Factory Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Conc
Kansas City Area										
1926-29	100.3	100.5	102.2	105.7	103.3	101.1	105.9	101.9	107.5	108.8
1939	104.4	109.9	109.8	118.3	115.4	103.8	117.2	113.0	120.0	121.6
1946	166.5	165.9	165.4	158.2	159.5	172.3	151.0	159.8	159.3	160.3
1949	215.9	216.7	216.3	209.0	211.1	221.1	199.4	210.0	211.7	213.5
1957	271.7	276.9	276.2	280.3	279.8	276.2	280.5	271.5	288.7	290.8
1958	273.9	278.2	277.2	284.8	279.2	283.0	286.7	276.2	294.0	295.2
Jan. 1959	277.1	281.3	280.1	287.5	282.0	286.7	289.4	279.6	296.8	297.7
Los Angeles Area										
1926-29	92.7	97.9	93.5	98.8	96.8	93.5	97.0	91.3	97.5	101.1
1939	93.6	97.2	97.5	103.7	105.0	95.6	109.5	96.8	106.2	104.9
1946	155.1	156.1	156.2	155.3	156.7	160.1	158.3	150.9	160.0	156.7
1949	203.2	207.0	206.0	209.9	210.7	205.3	201.2	201.8	210.2	212.6
1957	267.9	275.1	274.8	292.8	287.8	275.3	297.8	268.9	303.7	303.3
1958	268.6	277.9	276.9	302.6	294.4	276.3	310.8	272.0	316.4	314.5
Jan. 1959	271.5	281.6	280.6	307.8	299.7	280.5	314.8	275.0	321.3	318.9
Minneapolis Area										
1926-29	92.8	98.2	94.6	95.6	96.1	92.8	100.0	93.9	97.9	98.4
1939	101.9	105.0	104.2	113.5	110.7	102.7	113.1	103.6	114.5	117.2
1946	163.7	167.0	167.5	156.5	155.7	164.9	142.6	168.2	157.2	159.5
1949	218.7	218.7	217.7	205.1	206.9	224.1	192.6	211.7	205.8	208.0
1957	281.9	292.8	292.7	290.8	285.5	284.1	284.9	295.5	301.5	301.5
1958	283.6	295.7	295.5	297.6	289.7	286.3	293.0	298.6	310.4	309.9
Jan. 1959	287.5	299.4	299.2	301.7	293.8	290.1	295.9	302.1	313.9	313.2
New Orleans Area										
1926-29	93.3	96.3	93.4	86.5	90.6	93.3	93.7	91.5	89.5	86.5
1939	80.0	90.2	91.3	95.4	98.3	88.1	102.8	91.7	98.5	94.9
1946	148.9	147.7	148.2	138.6	142.8	151.2	138.7	145.3	132.0	138.7
1949	201.6	201.4	202.0	188.8	194.6	204.9	186.0	200.0	191.8	189.6
1957	250.4	254.1	255.1	253.7	256.5	253.3	257.3	255.1	261.3	259.7
1958	251.1	256.7	257.4	258.5	257.9	253.5	261.0	256.1	266.7	263.1
Jan. 1959	254.9	260.8	261.4	264.0	263.1	257.4	266.2	262.9	272.1	269.4
New York City Area										
1926-29	133.3	138.4	131.9	122.8	120.4	137.5	113.1	127.4	123.2	125.3
1939	122.1	123.3	122.5	130.6	125.9	125.6	123.7	119.6	130.0	133.3
1946	182.4	181.8	181.1	172.2	174.6	188.1	158.6	177.4	174.3	174.0
1949	230.8	243.7	242.7	242.8	238.2	247.5	217.3	238.3	240.0	240.4
1957	308.3	318.5	317.2	333.1	320.2	316.0	316.1	315.3	339.5	337.2
1958	315.1	325.0	325.0	348.6	331.3	324.5	329.3	324.0	357.3	355.1
Jan. 1959	322.5	332.8	335.0	362.3	341.0	332.5	332.4	334.0	368.8	381.1
Philadelphia Area										
1926-29	100.3	100.3	103.7	105.9	103.1	98.1	101.9	104.2	104.1	107.5
1939	99.2	102.6	102.9	105.7	104.1	98.2	102.0	105.0	105.5	106.7
1946	165.0	163.9	164.9	153.2	154.6	169.0	141.2	161.1	152.7	154.0
1949	220.5	220.6	220.3	209.0	209.0	224.3	190.3	216.3	205.6	209.9
1957	283.1	289.0	288.6	291.1	285.4	288.1	280.0	286.9	296.1	297.6
1958	286.0	292.6	292.1	299.2	293.8	291.2	287.9	289.6	304.4	307.3
Jan. 1959	291.3	300.2	300.0	312.7	303.2	297.4	301.6	296.7	321.1	323.1
Pittsburgh Area										
1926-29	113.3	118.8	112.8	111.2	107.1	115.4	89.6	112.2	104.6	112.9
1939	113.8	117.0	115.7	117.5	114.2	114.2	109.8	116.5	116.9	119.1
1946	169.5	169.0	168.0	156.6	155.1	173.5	140.1	160.4	151.2	158.9
1949	227.1	229.1	227.5	215.6	213.2	231.3	186.9	227.0	209.8	219.8
1957	290.4	294.8	293.5	296.5	288.3	292.2	280.8	294.1	302.0	306.8
1958	289.7	299.4	298.1	305.5	294.0	295.5	286.8	299.5	311.8	317.6
Jan. 1959	296.2	305.2	304.3	313.1	300.4	302.0	295.6	305.3	318.1	325.6
St. Louis Area										
1926-29	118.6	121.1	115.7	109.9	108.8	121.3	103.3	111.7	107.7	109.3
1939	107.0	110.2	109.9	118.7	116.4	107.6	114.3	110.3	119.2	119.8
1946	167.4	167.1	166.2	156.1	158.9	171.7	145.3	153.8	158.1	161.1
1949	220.7	221.4	220.7	212.8	212.4	226.8	197.5	217.3	213.6	215.7
1957	283.4	292.0	290.9	295.2	287.0	289.8	285.1	290.3	302.9	307.1
1958	287.9	297.0	295.2	304.9	293.4	295.2	295.2	293.8	313.8	318.6
Jan. 1959	292.6	301.1	299.5	310.5	297.7	301.4	299.6	298.4	318.3	324.5
San Francisco Area										
1926-29	87.7	93.7	90.4	97.5	96.5	86.1	95.5	91.8	93.9	99.0
1939	99.2	105.7	104.5	117.4	114.4	97.6	114.9	107.4	116.5	121.9
1948	157.5	159.7	160.0	157.9	159.0	160.5	151.5	158.4	160.0	159.3
1949	207.1	213.0	212.5	214.0	213.9	210.0	203.9	213.9	216.1	219.5
1957	274.4	286.3	285.6	302.9	294.2	275.6	295.5	288.2	310.7	315.2
1958	274.9	288.8	289.0	311.5	299.5	275.9	304.3	292.9	320.8	326.7
Jan. 1959	278.5	293.6	292.9	317.4	303.3	282.2	308.5	296.2	325.9	332.2
Seattle Area										
1926-29	84.5	92.2	89.2	101.7	95.1	82.1	100.8	92.2	100.5	105.9
1939	96.7	103.3	103.8	119.2	114.9	94.4	115.1	108.3	118.7	125.3
1946	152.9	158.3	157.9	161.2	156.8	153.3	156.0	158.9	163.2	167.1
1949	203.9	214.3	213.0	220.7	218.1	205.2	209.9	218.0	225.3	225.5
1957	254.0	275.6	276.0	298.2	289.0	250.9	294.4	288.5	311.2	313.1
1958	256.4	279.9	280.2	306.0	293.2	253.6	302.0	293.3	320.8	324.0
Jan. 1959	265.2	289.3	289.0	317.9	303.0	262.8	308.4	303.3	330.9	336.4
Washington, D. C.										
1926-29	106.6	107.7	107.9	107.1	105.9	106.0	103.0	108.0	106.4	108.4
1946	168.5	166.2	167.1	157.1	158.2	173.6	145.2	162.6	157.2	156.6
1949	223.1	223.3	223.1	213.5	212.6	227.2	194.8	218.6	210.4	214.6
1957	290.8	297.4	297.5	299.6	289.8	287.5	290.6	279.1	299.5	299.7
1958	291.8	298.5	298.5	303.9	288.2	288.1	297.4	283.4	305.7	302.2
Jan. 1959	295.2	302.3	302.0	308.5	292.0	293.3	300.8	284.3	310.1	307.3

For description of how these indexes are computed, see page 80

How one 2½-yd. shovel moves 2,000 yards of hard sandstone, clay and shale a day on Ohio road job

5th Manitowoc for Hatcher Bros. Pays Off on Road Building

This Manitowoc Model 3000 shovel equipped with a 2½-yd. bucket has been averaging 2,000 yards of sandstone, shale and clay per 10 hour day working on the rebuilding of Route 39 near Salineville, Ohio. Hatcher Bros. Inc. of Mingo Junction, Ohio is handling all the excavating and grading on the $417,000 job which calls for the regrading and removal of 117,000 yards of material, containing approximately 33% rock. In addition to the Model 3000, the company also owns two Manitowoc 1¼-yd. Model 2000 rigs and two 40-ton Model 2800 Mobile Cranes.

300,000 Yards of Rock — Prior to the present operation, the 2½-yd. shovel loaded out 300,000 yards of rock on another Ohio road job. The machine was moved to the present location in only three loads. "On both jobs," says Mr. Jim Smith, Superintendent, "the shovel has given us smooth, uninterrupted performance, with no appreciable downtime. We have never hit a rock formation that the machine could not break up and carry . . . nor have we been halted by a machine failure."

How You Can Benefit — Fleet owners like Hatcher Bros. know they can depend on their Manitowoc rigs for consistent, high output performance on any job. Judge for yourself . . . see your distributor soon for full details on any of the eight bonus-capacity Manitowocs.

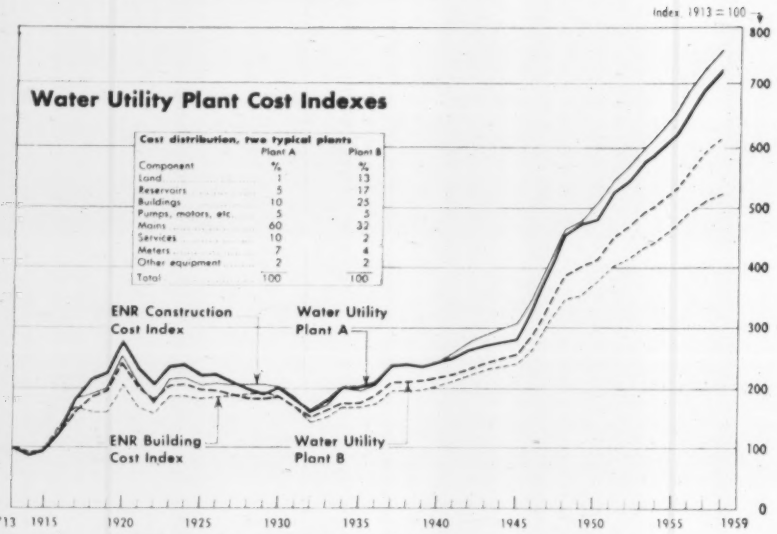
Manitowoc shovel cuts a 1' x 1' slope through stratified hard sandstone. Thirty per cent of the excavated rock is used as fill.

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	½-YD. - 5½-YD.	½-YD. - 6-YD.	½-YD. - 2½-YD.

Special Cost Indexes


Index 1913 = 100
Water Utility Plant Cost Indexes
Cost distribution, two typical plants
Component | Plant A % | Plant B %
Land 1 13
Reservoirs 5 17
Buildings 10 25
Pumps, motors, etc. 5 5
Mains 60 32
Services 10 2
Meters 7 4
Other equipment 2 2
Total 100 100
ENR Construction Cost Index
Water Utility Plant A
ENR Building Cost Index
Water Utility Plant B
'13 1915 1920 1925 1930 1935 1940 1945 1950 1955 1959
800 700 600 500 400 300 200 100 0

Water Plant Indexes:

To tailor a special cost index to the peculiar characteristics of any individual waterworks property, Henry H. Fick has come up with seven component indexes, one for each major class of waterworks plant investment. These can then be weighted and computed to fit the makeup of a specific property.

The way this works is illustrated by the two water utility plant cost indexes, A and B, as shown in the chart on the opposite page. These two plants differ in the ratio of mains to buildings or of services to reservoirs (table in chart).

The seven component indexes are based on the 13 cost indexes shown in the table for selected years.

The two sample water utility cost indexes shown, A and B, illustrate the effects of historical price changes upon two systems with identical kinds but dissimilar amounts of property.

The basic components of the two systems reflect the approximate dispersion of various classifications of property of two existing Pennsylvania utilities. For simplicity it has been assumed that: 1, all structures are made of brick and concrete; 2, the transmission and distribution systems are composed of cast iron mains; 3, services are constructed of wrought-iron pipe; and 4, equipment

Refinery Index:

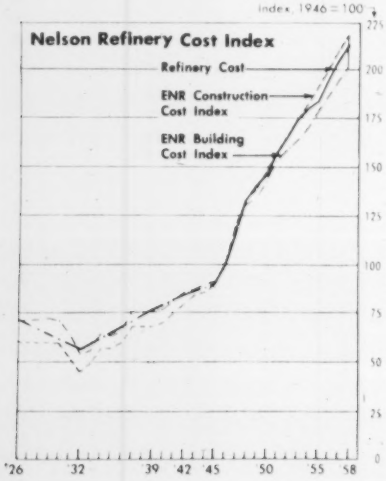
The Nelson index applies to the costs of constructing petroleum refineries and natural gasoline plants since 1946 and projected back to 1926.

It is published each month in the OIL AND GAS JOURNAL and is based on quotations from manufacturers of equipment used extensively in petroleum refineries and on proportions of steel,

What the Fick Waterworks Index Includes

Property Component Cost Indexes—1913 = 100

Building	1926	1932	1939	1940	1949	1955	1956	1957	Dec. 1957	1958	Dec. 1958
Engineering News-Record Building Cost Index	185.0	140.9	197.4	202.8	351.8	468.8	490.8	508.7	516.3	524.7	534.8
E. H. Boeckh & Assoc brick & concr comm & factory bldg, Pittsburgh, Pa. area	210.3	161.7	224.9	224.2	413.2	528.3	548.7	576.7	586.5	596.8	611.3
ICC Railroad constr index, station & office buildings, Region III 1910-14 = 100	185.0	142.0	168.0	172.0	369.0	466.0	486.0		586.0		
Handy-Whitman brick buildings index, North Atlantic Division	229.0	175.3	214.0	218.3	423.8	536.0	578.0	633.3	622.0	631.8	639.0
Materials											
6-in. & larger cast iron pipe, Delaware River Foundries	220.9	139.3	212.9	223.1	415.2	521.6	564.2	594.7	602.9	612.9	612.9
3-in. & under steel pipe, private sources	187.5	121.9	155.4	155.4	249.7	339.2	372.3	409.4	420.7	427.9	438.5
Motors, based on Handy-Whitman Index, North Atlantic Division	134.2	134.0	147.8	147.0	242.0	320.3	371.0	419.5	426.0	436.5	442.0
Contractors' equipment, based on Marshall & Stevens index	158.7	111.1	130.8	132.4	255.7	298.7	326.3	356.2	365.6	371.0	371.9
Office equip, based on Marshall & Stevens index	136.8	101.1	123.5	127.2	220.9	262.0	282.6	299.7	307.8	309.6	309.8
Meters, private sources	162.5	162.5	147.7	147.7	265.9	351.7	385.8	395.9	395.9	395.9	395.9
Common Labor, based on Engineering News-Record labor index, 20-cities average	288.1	224.7	359.5	367.9	763.2	1,084.7	1,136.8	1,201.6	1,233.7	1,281.6	1,306.3
Construction, based on Engineering News-Record Construction Cost Index	208.0	157.0	235.5	242.0	477.0	630.7	692.4	723.9	738.1	759.2	773.8
Gas utility costs, based on Handy-Whitman index, North Atlantic Division	212.0	174.5	229.6	235.2	432.9	569.0	621.9	662.7	679.6	690.7	703.7


Index 1946 = 100
Nelson Refinery Cost Index
Refinery Cost
ENR Construction Cost Index
ENR Building Cost Index
'26 32 39 42 45 50 55 58
225 200 175 150 125 100 75 50 25 0

Petroleum Refinery Cost Index

Compiled by W. L. Nelson, Petroleum Refinery Engineering Consultant published by Oil & Gas Journal, Tulsa, Oklahoma—1946 = 100

	1926	1932	1939	1942	1945	1949	1952	1953	1954	1955	1956	1957	1958	Dec. 1958
NELSON Refinery Construction Index †	*72.0	*56.6	*76.6	*83.7	*89.9	139.7	163.6	173.5	179.8	184.2	195.3	205.9	213.9	217.4
EQUIPMENT														
Heat exchangers	75.0	60.0	76.0	93.5	91.9	133.0	165.8	174.9	171.7	156.8	190.7	203.6	181.2	175.8
Instruments, control		90.0	89.5	85.5	90.6	122.0	146.2	151.8	154.6	162.9	182.1	187.4	194.9	197.0
Pumps, compressors			91.5	87.5	93.9	135.9	155.6	162.5	166.5	172.2	164.0	206.7	214.7	222.0
Electrical equipment	81.0	57.0	68.5	74.0	81.8	130.9	152.4	156.4	160.0	162.5	175.0	188.9	192.7	193.1
Internal Combustion engines			84.5	84.5	91.7	124.8	146.5	148.1	150.5	153.2	192.0	173.9	178.3	178.3
Miscellaneous equipment average	*94.0	*79.0	*82.0	*85.0	*90.0	*121.6	153.3	158.8	160.7	161.5	180.5	192.1	192.4	193.2
MATERIALS		68.0	82.0	86.3	89.7	143.6	164.3	172.4	174.6	176.1	190.4	201.9	204.2	206.5
LABOR		49.0	73.0	82.0	90.0	137.1	163.1	174.2	183.3	189.6	198.2	208.6	220.4	224.7

* Approximate, projection back to these dates from other cost sources.
† Used to compute Index until Apr 1952. Slightly different from the average of the miscellaneous equipment items shown

*Equipment prices, mainly from manufacturers as quoted to Oil & Gas Journal. *Materials Components from Bureau of Labor Statistics Wholesale Price Index, Code 10-1 Iron and Steel and Code 13, Building Materials. *Labor, half skilled and half common labor as quoted by Engineering News-Record. For base costs see ENR Oct. 8, 1953, p 115

How They're Figured

Waterworks Property

Cost Index Components, 1913 = 100

Henry H. Fick, Weber Fick & Wilson, Public Utility Consultants, Harrisburg

Year	Reservoirs	Buildings	Pumps and Motors	Distribution System	Services	Meters	Other Equipment
1946	346.0	298.7	174.8	390.2	329.9	222.5	183.1
1947	413.2	341.0	210.0	430.5	385.2	235.6	225.3
1948	460.7	394.9	218.8	505.9	439.5	288.9	242.2
1949	477.0	413.2	232.0	519.5	470.5	315.6	237.0
1950	509.6	421.4	251.2	533.3	496.4	336.4	246.3
1951	542.7	448.1	267.0	589.9	528.3	364.5	249.0
1952	569.4	467.1	296.5	613.9	560.1	370.8	248.8
1953	600.0	495.3	308.5	651.6	604.3	384.8	265.2
Dec '53	611.3	507.9	317.0	665.2	620.3	401.0	270.4
1954	628.0	510.2	317.0	673.1	635.1	403.9	270.4
Dec '54	642.7	514.1	317.0	679.5	647.8	405.7	269.7
1955	650.7	523.3	320.3	692.6	665.4	425.0	279.3
Dec '55	673.1	535.9	338.0	707.6	679.9	431.0	287.1
1956	692.4	548.7	371.0	735.9	701.0	460.9	303.1
Dec '56	703.8	562.4	406.0	783.2	717.8	471.6	315.4
1957	728.9	576.7	419.5	776.8	750.1	476.5	326.2
Dec '57	738.1	586.5	429.0	799.2	770.3	479.7	334.9
1958	750.2	599.8	436.5	813.6	795.0	484.5	338.1
Dec '58	773.8	611.3	442.0	821.0	811.6	486.9	338.7

includes motors, pumps, office, and contractors' items.

Tables showing the complete record of these water plant cost indexes by years from 1913 to 1958 are available without cost from: Mr. Henry H. Fick, Weber Fick & Wilson, Public Utility Consultants, 1801 North Front St., Harrisburg, Pa.

How It's Figured

common building materials and labor that represent average refinery construction.

The materials component includes two Bureau of Labor Statistics wholesale price indexes—Iron and Steel and Building Materials—and a miscellaneous equipment average published monthly on the Refinery page of the Oil and Gas Journal.

The materials component (40% of the total index) is computed by converting each of the two BLS price indexes to a 1946 = 100 base. The Iron & Steel Index, on the new base, is then multiplied by 0.6. The BLS Building Materials Price Index, on the new base, is also multiplied by a factor of 0.2. And the miscellaneous equipment price average is multiplied by 0.2.

Then, all three elements are added to determine the materials component.

The labor component is half skilled and half common labor, taken from ENR. Each of these average wage rates for the current month are divided by their 1946 average to make two wage indexes based on 1946 = 100. Then, each of these indexes is multiplied by a factor of 0.5 and added.

Building Construction (1911-14 = 100)

Complete Index reports 14 Items entering into Building Construction Costs.
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	July '45	Jan. '49	July '49	July '50	July '51	July '52	July '53	July '54	July '55	July '56	July '57	Jan. '58	July '58	Jan. '59
North Atlantic Division																						
A	213	213	171	159	205	207	250	253	260	436	433	448	479	485	519	534	547	609	676	679	688	694
B	228	229	189	173	211	214	246	250	265	429	421	436	474	479	503	523	527	572	616	622	633	639
South Atlantic Division																						
A	213	215	171	164	204	205	260	267	275	462	453	469	510	517	556	569	587	619	712	717	721	729
B	226	228	185	176	209	211	253	262	277	431	431	439	485	488	516	536	551	598	639	645	653	660
North Central Division																						
A	203	201	169	154	200	200	237	242	253	421	418	437	468	481	520	526	542	603	663	664	673	679
B	212	211	181	164	203	203	229	234	250	389	390	408	440	453	483	497	513	554	597	600	612	616
South Central Division																						
A	192	193	149	144	188	187	232	236	243	411	412	422	454	460	494	504	515	573	630	634	641	647
B	203	204	160	154	191	191	223	227	238	382	382	392	424	438	460	474	486	535	578	584	594	600
Plateau Division																						
A	198	197	153	149	194	194	230	235	239	402	397	417	451	456	480	495	506	563	625	627	636	637
B	211	210	167	163	199	200	221	227	233	396	395	410	442	447	464	481	492	532	573	564	549	552
Pacific Division																						
A	191	190	157	148	192	192	238	241	248	416	413	432	463	468	501	518	529	588	644	644	655	660
B	198	197	164	156	193	193	226	231	242	396	385	400	435	443	466	479	498	539	578	581	596	601

Gas Plant Construction (1911 = 100)

Complete Index reports 25 Items entering into Gas Plant Construction Costs.
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	July '45	Jan. '49	July '49	July '50	July '51	July '52	July '53	July '54	July '55	July '56	July '57	Jan. '58	July '58	Jan. '59
North Atlantic Division																						
A	230	230	202	188	241	249	272	275	288	469	464	476	519	536	561	580	605	672	717	734	745	760
B	212	212	209	195	274	278	297	299	301	447	481	485	549	554	590	609	615	715	799	816	823	849
South Atlantic Division																						
A	219	222	178	175	227	236	261	268	282	464	453	457	507	520	543	568	591	651	693	714	721	737
B	212	212	209	195	274	278	297	299	301	481	482	485	549	554	590	609	615	715	799	816	823	849
North Central Division																						
A	215	218	198	178	232	232	249	254	266	435	431	447	489	503	531	554	572	630	672	684	694	706
B	212	212	209	195	274	278	297	299	301	447	481	485	549	554	590	609	615	715	799	816	823	849
South Central Division																						
A	199	200	171	160	216	217	244	249	261	420	419	429	470	475	496	522	538	595	632	648	655	667
B	212	212	209	195	274	278	297	299	301	447	487	485	549	554	590	609	615	715	799	816	823	849
Plateau Division																						
A	202	202	176	166	216	217	232	237	243	403	398	405	439	460	476	501	517	575	612	623	630	641
B	212	212	209	195	274	278	297	299	301	447	481	485	549	554	590	609	615	715	799	816	823	849
Pacific Division																						
A	205	206	187	177	227	228	253	257	266	433	428	437	480	494	516	544	561	620	661	673	688	699
B	212	212	209	195	274	278	297	299	301	447	481	485	549	554	590	609	615	715	799	816	823	849

Electric Light and Power Construction (1911 = 100)

Complete Index reports 64 Items entering into Electric Light and Power Construction Costs.
A relates to Total Constr. & Equip. All steam; B to Accessory Electric Equipment; C to Sub-Sta. Equip.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	July '45	Jan. '49	July '49	July '50	July '51	July '52	July '53	July '54	July '55	July '56	July '57	Jan. '58	July '58	Jan. '59
North Atlantic Division																						
A	197	194	182	176	224	225	248	248	250	401	400	409	468	480	506	517	524	577	610	620	627	635
B	197	196	192	186	225	224	241	239	237	380	341	360	420	430	457	460	468	490	519	536	543	545
C	184	178	172	168	203	203	217	216	218	406	312	320	359	366	392	396	400	414	464	477	484	485
South Atlantic Division																						
A	201	201	188	180	232	233	262	267	273	430	422	430	490	504	536	547	559	616	651	662	667	678
B	200	203	200	191	239	240	260	262	248	352	356	374	431	442	474	482	494	512	546	562	564	571
C	187	183	180	173	217	218	235	237	228	322	325	333	370	377	409	417	425	466	491	502	506	510
North Central Division																						
A	190	187	186	174	219	218	235	238	243	375	374	382	443	456	486	495	504	555	587	595	601	609
B	189	188	199	186	224	223	229	231	218	309	307	324	382	391	419	424	432	451	478	492	497	501
C	178	171	181	169	203	202	207	209	200	275	280	286	326	333	359	364	369	409	427	438	444	446
South Central Division																						
A	184	183	179	171	218	218	245	246	251	391	390	398	454	465	496	506	515	567	601	611	617	623
B	182	189	200	190	241	240	250	248	235	341	340	357	415	424	453	460	470	488	517	533	539	543
C	175	171	181	173	210	209	226	226	217	310	311	319	352	356	385	392	398	438	457	470	476	478
Plateau Division																						
A	190	188	177	171	218	219	234	236	241	378	378	386	443	454	482	493	500	553	594	601	608	612
B	192	196	194	188	231	232	237	236	225	322	323	341	399	408	437	440	446	457	494	508	509	513
C	185	177	175	171	209	211	213	212	207	289	294	302	341	347	374	378	381	413	442	451	453	455
Pacific Division																						
A	180	178	172	163	216	215	235	242	244	383	380	389	450	456	486	495	503	557	590	600	608	617
B	178	177	182	170	222	222	231	240	225	328	323	343	408	413	437	438	447	471	495	517	520	525
C	167	161	164	155	203	202	210	219	208	298	297	307	357	359	382	384	390	435	451	469	473	480

Public Utility Construction Costs

Individual series for 103 cost elements in three classes of utility construction, for six geographic divisions of the United States, are reported semi-annually. Weighing is based on experience in cost analysis of plants and building. Material prices are from Engineering News-Record, Iron Age *and various manufacturers; labor rates from BLS, unions and builders associations. Whitman, Requardt and Associates, Baltimore, Md.*

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helps support
THE SKYLINE OF AMERICA

WASHINGTON *276 Structures rest on Raymond Foundations*

BOSTON *81 Structures rest on Raymond Foundations*

Photos by
Fairchild Aerial Surveys, Inc.

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KANSAS CITY
130 Structures rest on Raymond Foundations

ATLANTA 75 Structures rest on Raymond Foundations

NEW ORLEANS
217 Structures rest on Raymond Foundations

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PITTSBURGH - GARY

America's Most Complete Line of Industrial Fasteners

Railroad Cost Index—

Road Construction

Interstate Commerce Commission —1910-14 = 100

Dist & Reg.	Ratio*	Index 1926	1932	1939	1945	1949	1956	1957
I to VIII	66 66	167	131	137	197	270	352	370
I East	73 53	173	144	140	206	287	363	381
II East	64 18	168	133	141	202	283	367	386
III East	63 85	168	132	142	205	286	368	388
IV South	62 86	163	126	131	195	259	340	358
V South	66 85	165	129	136	195	265	348	366
VI West	71 24	164	129	132	190	253	347	355
VII West	66 57	166	131	133	188	256	340	358
VIII West	69 00	168	133	140	198	270	351	369

Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

* Ratio is per cent of accounts included to total of all accounts, at 1910-14 prices, computed in 1953. Ratios computed in other years are in bottom table.

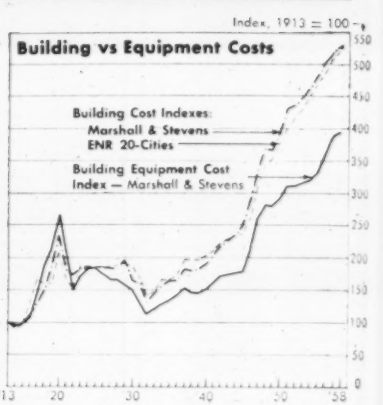
By Accounts	1926	1932	1939	1945	1949	1956	1957
Engineering	166	131	137	197	270	352	370
Other rt of way exp	159	121	135	201	258	298	315
Grading	153	106	90	144	139	152	159
Tunnels & subways	178	119	140	236	339	382	404
Brdg, culv & trestl	170	122	149	240	374	456	482
Elevated structures	165	129	149	239	382	501	529
Ties	173	144	158	241	302	359	381
Rails	144	130	136	152	245	376	406
Other track material	177	163	167	176	278	389	426
Ballast	175	136	143	181	254	331	348
Track laying & surf	188	164	165	273	396	506	541
Fences, snow sheds	178	147	141	189	279	374	393
Station & office bldgs	184	141	166	244	368	480	500
Roadway buildings	187	140	162	258	386	482	504
Water stations	182	147	166	227	327	423	448
Fuel stations	180	144	159	242	357	459	484
Shops & eng houses	185	137	165	248	379	489	510
Grain elevators	190	147	164	256	367	480	502
Storage warehouses	189	147	166	253	372	494	517
Wharves & docks	177	136	153	235	350	431	453
Coal & ore, wharves	174	136	154	236	341	420	445
Tel & Tel lines	157	121	129	178	250	347	356
Sgnls & intrlocks	169	130	143	176	229	332	347
Power plants	186	138	167	246	386	517	537
Powr transmissn sys	176	143	148	180	266	384	402
Misc structures	180	141	161	229	328	487	510
Roadway mach	136	138	150	194	280	377	411
Roadway small tools	190	155	180	260	315	500	520
Public impr const	169	131	142	217	321	377	397
Shop mach	197	163	207	296	422	442	459
Power plant mach	165	138	178	181	242	344	375
Work equipment	180	165	200	254	348	484	501

Ratio of RR costs

	Computed 1930	1945	1953
	%	%	%
Road construction	68 75	68 30	66 66
Equipment, work	0 66	0 56	0 54
Equipment, rolling & floating	23 63	24 47	26 38
General	7 56	6 57	6 42
Total	100 00	100 00	100 00

Indexes for 1957, by Engineering Section, Bureau of Accounts, Cost Finding and Valuation, Interstate Commerce Commission, include items developed from analysis of major construction contracts over a period of years. Indexes for material accounts are based on studies of carriers' returns to Valuation Order 14, joint studies made with various subcommittees of President's Conference Committee, engineering and trade publications, contracts covering major construction projects, and information furnished by individual carriers.

Equipment Costs



Industrial Equipment Rise Slowed Down Last Year

The cost of industrial equipment, installed, was only 0.9% higher in December, 1958 than in December, 1957, according to Marshall & Stevens index. This compares with a 5% rise in the twelve months ending December, 1957.

The Marshall & Stevens equipment cost indexes cover the composite of the entire plant. Machinery of various kinds, mechanical installation, furniture and fixtures, hand tools and other items are combined in proper proportion to their average occurrence in each plant and computed for 47 industries. Eleven series are reproduced here.

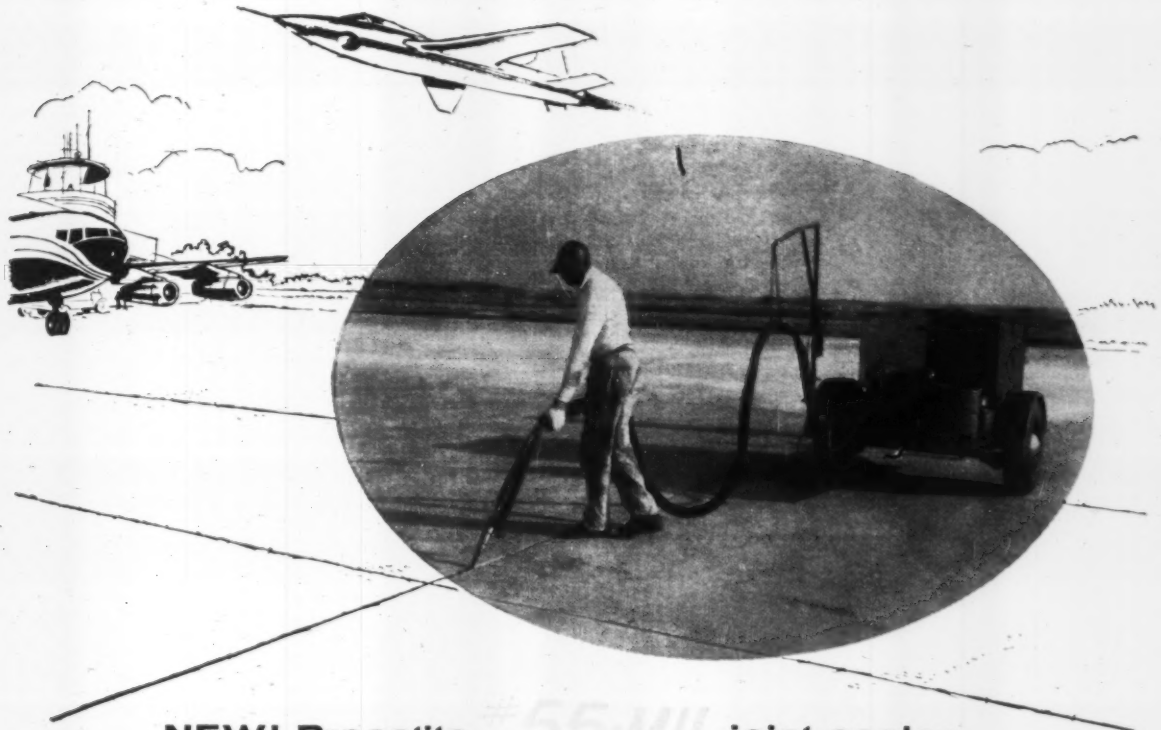
Annual values of the indexes from 1913-1947 appeared in ENR May 27, 1948, p. 121; values for 1948-1956 appeared in ENR March 20, 1958, p. 42.

Industrial Equipment Cost Indexes

Marshall & Stevens, Inc. of Chicago
1926 = 100

Industry Average of All	1939 84 8	1949 161 2	1957 225 1	1958 229 2	Dec 1958 231 3
Commercial, av. of 12*	86 8	152 7	207 8	211 6	212 9
Transportation, garage	83 6	170 1	248 6	252 7	255 9
Public utility, av. of 2*	82 9	156 7	221 1	225 3	227 6
Process, av. of 9*	83 6	161 1	225 6	228 5	229 5
Food, av. of 10*	84 9	166 2	230 4	234 0	236 1
Metal working	83 6	161 8	224 3	228 7	230 1
Aircraft	85 0	177 5	252 8	262 8	264 9
Mach & parts, elec eq	83 4	167 7	237 5	242 2	244 6
Textile	83 7	157 3	247 8	252 2	254 6
Woodworking	83 6	160 4	221 8	225 8	227 8
General, av. of 7*	84 6	161 8	226 5	230 4	232 2
Cold storage, refrig	82 1	175 8	254 2	258 6	260 6
Contractor's equipment	82 4	161 1	224 4	230 7	234 3

* In each of these groups, MARSHALL AND STEVENS reports separate comparative equipment cost trends for:
COMMERCIAL: Apartment, church, hotel, bank, library, restaurant, school, store, theatre, hospital, dwelling, office
GENERAL: Laundry, mining and milling, motion picture, printing, shipbuilding, warehouses, logging
PUBLIC UTILITY: Steam power, electric power
PROCESS: Distillery, cement, chemical, glass, petroleum industry, paint, paper, rubber, clay products
FOOD: Bakery, bottling, brewery, candy, cannery-fish, cannery-fruit, creamery, dairy, flour cereal feed, packing-fruit, packing-meat



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resists jet blast, heat, fuel and oil... cures quickly...will not track

Here is the strongest, toughest, most economical sealant of its kind on the market today . . . *laboratory tested and field-service proved!* Presstite No. 55-MIL Sealer is a Polysulfide Polymer, two-component, cold-applied sealing compound, specifically designed for sealing joints in Portland Cement Concrete, military and commercial airfield paving, exposed to the action and operational requirements of jet aircraft.

1. **Resists repeated blast** from high jet turbine thrust.
2. **Resists super-elevated temperatures** of after-burner "cut-in".
3. **Resists impregnation** by foreign materials.
4. **Resists action of jet fuels:** JP-3, JP-4, JP-5; "SKYDROL" (fire-resistant hydraulic fluid); also detergents and oils.
5. **Resists action of repeated freeze-thaw cycles,** will not crystallize at sub-zero temperatures.
6. **Maximum adhesion** to clean concrete surfaces.
7. **High cohesive strength.**
8. **High ductility,** remains ductile at *minus* 20°F.
9. **Fast curing,** sets up tack and is track-free within 60 minutes after application.

For a joint sealant that will *last*—specify Presstite No. 55-MIL Sealer *first*—get tomorrow's sealer today!

Note: A modification of No. 55-MIL is available for sealing joints in PCC highways, bridge decks, parking lots and industrial floors. Known as Presstite No. 55-HWY (Highway Type). Your inquiry is invited. Write Dept. C-2.

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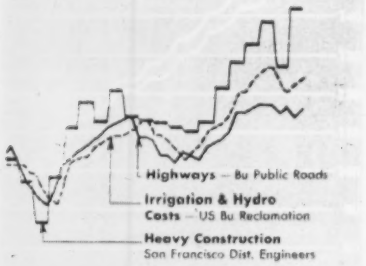
Heavy Construction Cost & Price Indexes

Highway Bids Buck Price Trend

Rising Costs Push Bid Prices Up



Increased costs are forcing heavy construction contractors to raise bid prices, except in several states where highway bids are dropping as contractor competition intensifies.

The U. S. Bureau of Public Roads Composite Mile Index showed bid prices on federal-aid highways rising in the fourth quarter. But eight states report just the opposite. Only California and South Dakota state highway department bid price indexes agree with BPR.

Contractors' bids are down in Colorado, Idaho, Michigan, Nevada, New York, Oregon, Texas and Washington.

Stiffer competition is evidently pulling bids down. Average number of bidders increased between the third and fourth quarters of 1958 in each of these states except New York. California also reported more bidders per highway contract in the fourth quarter, although its bid-price index reversed its sharp downtrend.

By contrast, bid prices rose on heavy construction projects let in western states during the second half of 1958. The contract price index of the San Francisco District Corps of Engineers jumped nearly 12% above the first half of last year to set a new high (see chart).

Irrigation and hydro construction costs in western states and Alaska staged their second consecutive rise this January. But the Bureau of Reclamation composite index is below its peak.

Highway Price Indexes in 10 States and the US

Reported by state highway departments — US Bureau of Public Roads Indexes, 1925-29 = 100

Base Year = 100	California 1940	Colorado 1949	Idaho 1950	Michigan 1940	Nevada 1955	New York 1940	Oregon 1940	South Dakota 1940	Texas '49 '53	Washington 1940	Excavation[1] 17,431* cy Price $0 35[5]	Excavation[1] 17,431* cy Index 100 0	Surfacing[2] 3,725* sy Price $2 22[5]	Surfacing[2] 3,725* sy Index 100 0	Structures: Reinf. steel 15,000* lb Price $0 052[5]	Structures: Struct. steel 4,325* lb Price $0 067[5]	Structures: Struct. concr. 68* cy Price $22 15[5]	Combined Index 100 0	Composite Mile Index 100 0	ENR Construction Cost Index 100 0
1956 Av	247 3	92 8	118 3	185 4	118 2	252 2	193 8	198 8	105 0	214 1	0 38	108 2	3 89	175 5	0 131	0 202	54 33	253 8	163 3	334 6
1957 Av	264 3	97 3	116 1	173 0	124 3	268 5	187 8	205 6	108 2	226 4	0 40	113 5	4 02	181 2	0 137	0 218	56 92	267 0	170 0	349 8
Q1	257 2	96 1	95 9	111	105 5	274 4	182 7	189 0	107 1	233 1	0 39	111 7	4 01	180 8	0 141	0 215	57 46	270 6	169 7	342 4
Q2	266 9	105 1	109 0	171 6	130 1	261 7	202 0	213 7	108 3	232 2	0 40	113 3	4 00	180 3	0 137	0 221[5]	57 35	268 7	169 8	338 6
Q3	267 5	100 0	143 4	112	128 7	258 3	188 0	200 0	110 1	225 1	0 40	112 5	4 02	181 3	0 135	0 225	57 18	268 3	169 9	356 5
Q4	262 1	103 5	116 2	174 3	119 8	251 1	173 4	190 1	106 9	216 7	0 41	116 5	4 04	182 2	0 135	0 210	55 80	260 3	170 6	356 7
1958 Av	236 5[6]	96 1	96 4	171 4[6]	113 3	257 2[6]	172 1[6]	184 5	115 9[6]	211 1[6]	0 39	112 5	4 02	181 1	0 130	0 193	54 92	253 3	167 5	366 8
Q1	241 8	93 7	103 8	111	117 2	272 1	159 3	170 6	109 2	212 7	0 39	110 3	4 02	181 3	0 131	0 201	54 99	255 6	167 1	359 7
Q2	231 0	102 5	92 1	175 0	108 0	266 8	180 0	213 5	118 3	210 1	0 39	111 5	4 03	181 7	0 130	0 192	54 85	252 9	168 5	365 9
Q3	228 5	99 9	97 0	172 7	124 2	252 5	181 1	175 9	120 8	211 0	0 39	111 4	3 97	179 0	0 130	0 186	54 55	251 1	165 7	373 7
Q4	228 5	92 7	90 5	162 7	103 3	227 3	167 8	209 8	115 2	205 5	0 40	113 7	4 01	182 2	0 129	0 191	55 28	253 2	168 5	373 9

[1] Common excavation plus other expressed as equivalent common excav. [2] Portland cement concrete plus other expressed as equivalent port. cem. concr. [3] Fixed quantities used for establishing price trend. [4] Prices for base year index. [5] Last month of quarter. [6] Based on 1925-29 = 100. [7] ENR average of quarterly indexes.

Western States Unit Price Indexes

Estimates Section, San Francisco District, Corps of Engineers, 1st Half 1946 = 100

		1946 1st half	1949 1st half	1956 1st half	1957 1st half	1957 2nd half	1958 1st half	1958 2nd half
Index, 1st Half '46	100	100 0	132 2	154 74	170 37	178 68	163 07	182 02
Items used in index	Unit	Based on these average unit prices						
Cr rock base course	ton	2 81	2 20	3 18	3 41	3 39	3 65	2 69
Plant mix aggregate	ton	4 82	4 43	6 19	6 97	6 26	7 28	6 83
Plant mix asphalt	ton	22 00	26 85	21 74	21 50	24 00	25 19	23 00
Cover aggregate	ton	5 09	5 65	6 60	7 13	6 71	7 02	6 96
Structural concrete	cy	50 65	65 07	72 00	82 00	82 00	79 00	84 00
Pavement concrete	cy	13 20	19 19	24 00	23 00	26 00	20 00	28 00
Reinforcing steel	cwt	9 60	12 70	13 00	17 00	18 00	17 90	18 00
Cement	bbl	2 84	4 98	5 01	5 11	5 12	5 00	5 15
CM pipe 12"	lf	2 20	3 03	3 98	3 48	3 57	3 33	3 52
CM pipe 24"	lf	4 05	5 26	6 60	8 03	7 60	7 56	7 87
RC pipe 18"	lf	3 50	4 27	5 91	6 23	6 46	6 58	6 58
RC pipe 36"	lf	8 29	10 47	11 86	13 75	13 13	12 72	13 20
VC pipe 6"	lf	1 87	2 39	3 50	3 70	3 37	3 31	3 90
VC pipe 8"	lf	2 22	2 80	3 99	3 67	3 99	4 01	4 65
Sewer manhole	1 10 ea	16 50	20 80	24 90	28 20	27 70	27 30	30 00
Roadway excavation	cy	0 62	0 96	0 92	1 05	1 04	1 09	1 15
Structural excavation	cy	2 49	4 27	3 63	5 42	3 66	3 78	4 25
Watering	M gal	2 13	2 13	1 76	1 92	2 00	1 80	1 86
Flat wheel roller	R-hr	5 47	7 82	8 15	10 06	11 72	11 31	11 00
Piling, green wood, fur	lf	0 64	0 65	1 35	0 805	0 84	1 00	0 88
Piling, treated, fur	lf	1 25	1 45	2 00	2 75	4 14	1 72	2 07
Timber in place	100 fbm	16 60	26 33	45 20	50 50	58 10	39 30	58 30
2" Galv steel pipe	lf	1 01	1 38	1 60	1 62	2 23	1 62	1 66
Cast-iron pipe 6"	lf	2 86	4 12	4 34	5 42	5 32	5 40	6 29
Cast-iron pipe 8"	lf	3 80	6 47	5 23	6 07	6 79	6 27	7 55
Gate valve 6"	1 10 ea	7 06	9 70	12 50	10 08	11 80	11 50	12 10
Total in dollars		193 65	256 01	299 67	329 93	346 03	315 79	352 49

* Revised

Irrigation and Hydro Cost Indexes

US Bureau Reclamation, Denver Office, Indexes, 1949-51 = 1.0

Class of Construction	1940	January 1946	January 1949	January 1956	January 1957	1958 Jan.	1958 Oct.	1959 Jan.
Composite index	0 47	0 76	1 04	1 16	1 24	1 30	1 26	1 28
Dams, earth	0 50	0 85	1 12	1 07	1 15	1 23	1 10	1 12
Dams, concrete	0 47	0 76	1 00	1 04	1 11	1 16	1 12	1 13
Pumping plants, bldg & equip	0 48	0 69	1 02	1 31	1 33	1 36	1 46	1 47
struct, reinf conc, & improv	0 43	0 68	1 06	1 24	1 31	1 36	1 33	1 33
equipment	0 55	0 70	0 98	1 38	1 36	1 58	1 63	1 65
pumps & prime equip			0 94	1 44	1 64	1 66	1 71	1 73
access elec & misc equip			1 05	1 25	1 41	1 44	1 39	1 50
steel penstocks, disch pipes			1 10	1 47	1 66	1 72	1 69	1 72
Canals	0 46	0 78	1 08	1 08	1 06	1 19	1 13	1 13
Conduits, tunnels, free flow, concrete lined		0 68	1 02	1 17	1 24	1 30	1 29	1 29
Laterals and drains	0 41	0 70	1 02	1 18	1 26	1 32	1 30	1 32
Primary roads	0 48	0 82	1 06	1 19	1 19	1 24	1 23	1 24
Secondary roads, unsurfaced	0 50	0 86	1 14	1 11	1 13	1 19	1 19	1 19
Bridges, steel	0 46	0 76	1 06	1 17	1 47	1 52	1 47	1 48
Power plants, hydro, bldg & equip	0 50	0 71	1 01	1 31	1 43	1 48	1 49	1 51
struct, reinf conc, & improv	0 44	0 70	1 05	1 24	1 30	1 36	1 34	1 34
equipment	0 55	0 73	0 96	1 36	1 53	1 54	1 60	1 61
turbines & generators	0 56	0 76	0 97	1 39	1 57	1 58	1 62	1 64
access elec equip	0 54	0 65	1 01	1 29	1 44	1 48	1 52	1 52
misc equip	0 51	0 70	1 05	1 29	1 43	1 40	1 44	1 44
Concrete pipe lines	0 55		0 96	1 15		1 29	1 32	1 33
Transm switchyards & substa	0 54	0 50	0 99	1 41	1 56	1 60	1 60	1 61
Transm lines, wood pole 115 kv	0 50	0 80	1 24	1 06	1 09	1 16	1 23	1 23
Steel tower 230 kv				1 28	1 37	1 41	1 41	1 41
Permanent genl property, bldgs	0 44	0 62	0 95	1 25	1 30	1 30	1 33	1 35

Based on combined costs of material and labor furnished by the contractor, and material and labor furnished by the government on US bureau of Reclamation projects in 17 western states and Alaska

KOHLER ENGINES

4-cycle Short-stroke Air-cooled

MODEL

K160

- Balanced crankshaft— ball bearings at both ends.
- Externally mounted breaker points.
- Positive splash lubrication.
- Cylinder and crankcase are made of metallurgically controlled close grained cylinder iron.
- Mechanical governor for accurate R.P.M. control

Industrial Sweeper

Kohler engines are conservatively rated, quick-starting, reliable.

Experienced application engineers are ready to help you choose the engine that will do the job.

Kohler Co. has manufactured internal combustion engines for 38 years.

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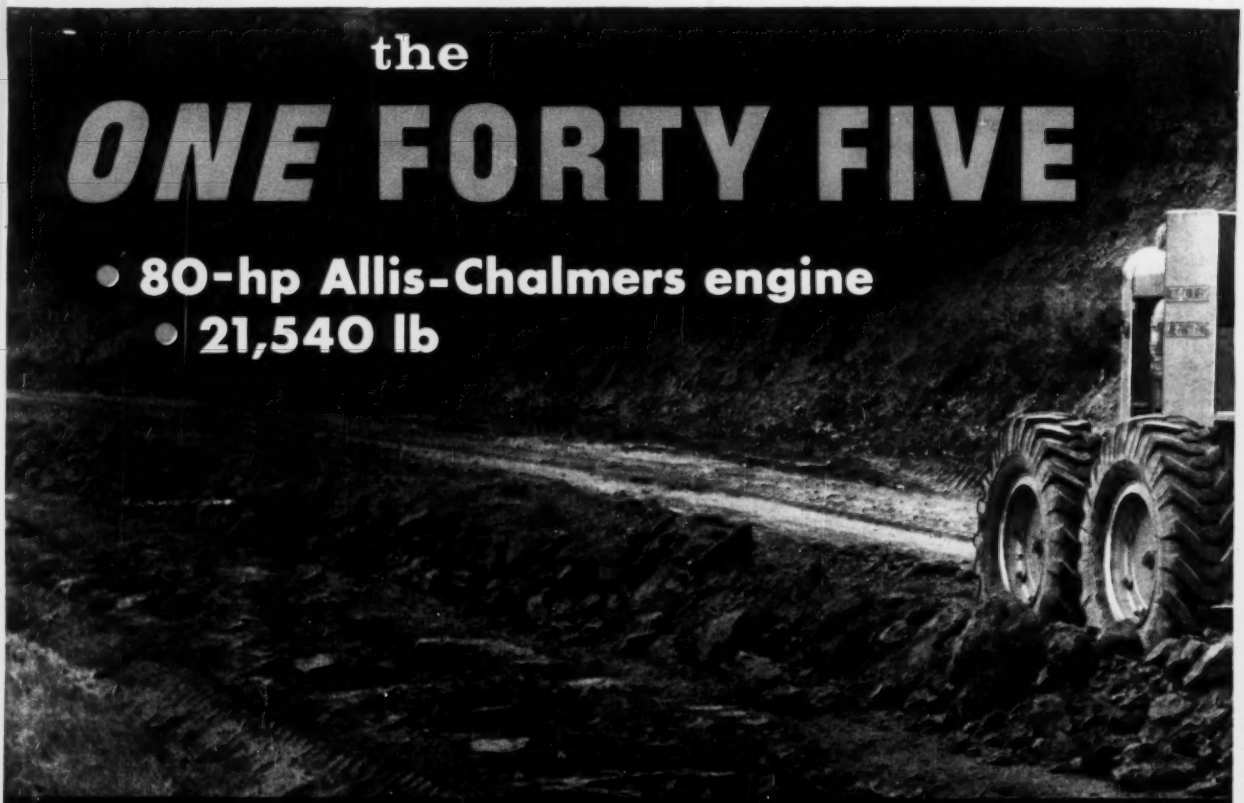
Allis-Chalmers announces a new motor grader in the 80-hp class



... Another outstanding motor grader joins the Allis-Chalmers line
the ONE FORTY FIVE

MODEL D
58-hp Allis-Chalmers engine
8,800 to 11,450 lb

ONE FORTY FIVE
80-hp Allis-Chalmers engine
21,540 lb

FORTY FIVE
127-hp Allis-Chalmers engine
23,800 lb

move ahead with **ALLIS-CHALMERS**

BEST BUY IN THE MEDIUM-POWER FIELD

- Heavy-duty throughout at a money-saving price.
- Designed and built for long, hard service on any construction or maintenance assignment.
- Retains the widely-accepted characteristics and performance features of the 127-hp Allis-Chalmers FORTY FIVE grader.
- Offers the best combination of operator features of any grader near its size.

Operator advantages no other medium-priced grader can give you . . . "wide-open" visibility . . . over-the-circle lift cases . . . suspended pedals and exclusive no-kick, toggle-type controls.

Power for high production. Husky, high-torque Allis-Chalmers diesel engine handles overloads without shifting down . . . geared for good range of travel and working speeds.

Load-handling ability second to none. The new *ONE* FORTY FIVE has a 26½-inch-high arched front axle—and highest throat clearance in its class. You get more dirt to the ROLL-AWAY moldboard and move it with efficient rolling action that uses less power.

See the new *ONE* FORTY FIVE motor grader at your Allis-Chalmers dealer's. Check its dollar-saving price. Then check its 80 hp and 21,540 lb on an actual demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

ROLL-AWAY is an Allis-Chalmers trademark.

....power for a growing world

Basic Cost Factors

Cost of Construction's

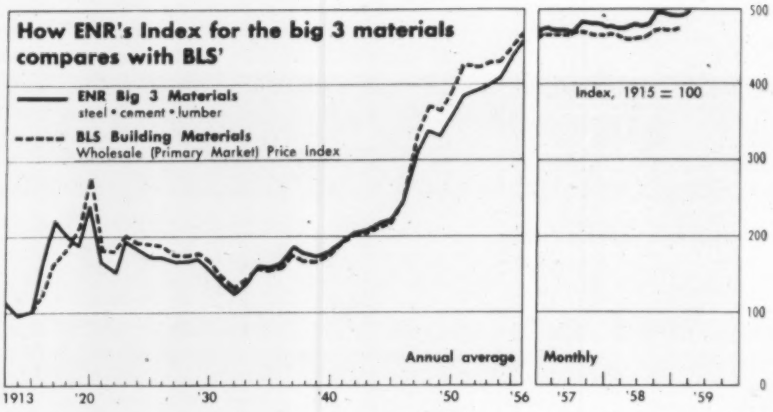
Materials: More Hikes Than in '58

Construction contractors can expect more materials price increases this year. But supplies and deliveries should prove no problem; capacity for producing key materials is adequate to meet a rising demand.

However, increasing production and distribution labor costs will probably be passed on in higher price tags to be paid by contractors.

A steel strike could hurt contractors who don't get their third-quarter structural steel needs on the ground by June 30. Warehouses expect to have enough inventories to carry contractors through a strike lasting a few weeks, so there will probably be no problem in obtaining miscellaneous steel items.

But contractors who purchase their steel directly from the mills can't count on warehouses to supply their needs if the mills are shut down.



Steel prices at the mill are expected to rise this summer by $4 per ton, or 3.6%, ENR estimates.

Cement prices appear set to hold for the balance of this year, after being upped by some northeastern and far western mills last January.

Lumber and plywood prices are rising now. But some slackening in the housing market shows a dip is likely later.

Machinery: No More Price Increases Likely Until Late '59

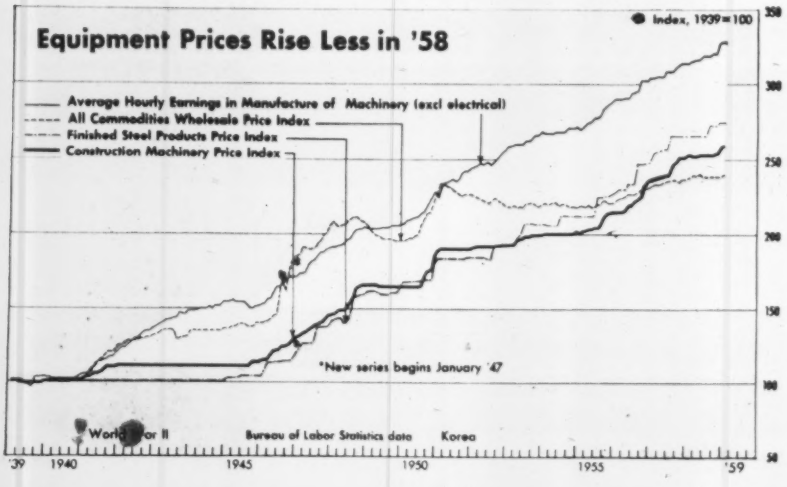
Construction equipment prices should hold at current lists until the late fall. This may be little consolation, however, to contractors who have to pay an average of 3.3% more now than a year ago for new equipment.

The U. S. Bureau of Labor Statistics Index of Manufacturers' Prices hit a record of 170.8 on January 15, based on 1947-49 = 100. This reflects widespread increases during the last three months of 1958. The pattern of increases late in the year has held since 1955 and will probably be repeated late in 1958 because of almost certain increases to come in steel and labor costs.

There is, however, one bright spot for contractors in this picture. BLS price indexes dipped 2% in January for two-wheel scrapers in the 14-18 yard class and 1.3% for rubber-tired, off-highway tractors.

Supplies and deliveries of new machines should be good in '59. Possible exception is Allis-Chalmers equipment.

Negotiators got together last week for what some call the only sign of progress in settling the strike.



Equipment Price Indexes

US Bu Labor Statistics Indexes, 1947-49 = 100

	Jan. 1959	Jan. 1958	Change %
All Types of Equipment	170 8	165 4	+3 3
Cranes, Draglines, Shovels	168 3	163 0	+3 3
Shovel, ½ cu yd	156 2	153 7	+1 6
Shovel, ¾ cu yd	173 3	167 4	+3 5
Shovel, 1-1½ cu yd	183 7	174 3	+5 4
Shovel, 2-2½ cu yd	158 8	154 4	+2 8
Shovel, 3-3½ cu yd	165 2	162 7	+1 5
Shovel, 6 cu yd	184 1	179 5	+2 6
Crane, truck mounted	168 8	164 2	+2 8
Crane, tractor mounted	135 1	135 1	0
Bucket, clam shell	157 5	152 7	+3 1
Bucket, dragline	189 7	180 8	+4 9
Scrapers and Graders	163 6	158 8	+3 0
Scraper, 4 Wheel, 8-10.5 cu yd.	155 0	155 0	0
Scraper, 4 Wheel, 12-15 cu yd	154 4	151 3	+2 0
Scraper, 2 Wheel, 14-18 cu yd (a)	123 7	122 7	+0 8
Grader, heavy duty	171 1	164 0	+4 3
Grader, light & medium	166 1	161 2	+3 0
Tractors (non-farm, inc. industrial)	187 0	180 8	+3 4
Wheel-type, off highway (a)	128 2	127 7	+0 4
Crawler, 45-60 dhp	191 9	182 6	+5 1
60-80 dhp	196 4	185 8	+5 7
80-120 dhp	191 3	186 7	+2 5
120 & up dhp	201 3	191 8	+5 0
Machinery, Tractor Mounted	168 4	161 7	+4 1
Dozer, cable control	154 4	151 6	+1 8
Dozer, hydraulic control	186 6	177 3	+5 2
Loader, shovel type	161 0	153 9	+4 6
Specialized Machinery	153 2	150 2	+2 0
Ditcher	156 6	154 1	+1 6
Roller, tandem	198 6	193 2	+2 8
Roller, 3 wheels	170 2	161 6	+5 3
Ripper and rooter	150 5	143 3	+5 0
Dewatering pump, 10 M gph	112 0	111 7	+0 3
Dewatering pump, 90 M gph	145 7	142 4	+2 3
Portable Air Compressors	159 5	159 1	+0 3
Contractors Air Tools	175 9	164 3	+7 1
Mixers, Pavers, Spreaders	153 8	148 8	+3 4
Mixer, portable, 16 cu ft	168 6	162 7	+3 6
Mixer, truck, 6 cu yd	129 1	125 7	+2 7
Mixer, paving, 34 cu ft	188 6	185 2	+1 8
Concrete finisher, & spreader	183 5	173 0	+6 1
Bituminous distributor	122 3	122 4	−0 1
Bituminous spreader	170 2	160 3	+6 2
Bituminous paver	155 8	153 8	+1 3
Off-Highway vehicles (b)	101 1	100 0	+1 1
Contractors off-highway truck (b)	101 1	100 0	+1 1
Trailer dump truck (b)	101 4	100 0	+1 4

(a) January 1955 = 100 (b) January 1958 = 100

Basic 4 M's Are Going Up

Manpower: Long-Term Contracts Perpetuate Wage Rise

What wage increases will result from spring negotiating must be left to the Ouija boards for the moment. However, wage increases provided for in existing long-term contracts will push construction costs up in many areas.

Deferred wage increases for 1959 will average a healthy 14 cents per hour for key trades in several of the twenty cities checked by ENR. Common labor, skilled labor, and equipment operators average increases range from 12 to 15 cents (see table at right). Carpenters will show the heftiest gains with 15.5 cents guaranteed on the average.

The tendency toward long-term contracts with guaranteed periodic increases is apparently here to stay. Most wage agreements to be negotiated this year are expected to have deferred wage provisions.

While critics point out that these provisions tend to drive costs higher without guaranteeing any real increase in productivity, advocates of the system insist that it provides management with fore-knowledge of labor costs and long-term security against walkouts.

All of which still leaves the industry with the pressing problem of increasing productivity—a problem whose solution is of vital interest to all.

These 1959 Wage Increases Are Automatic

For key trades in 20 U.S. cities

City	Common Labor: Building	Common Labor: Heavy Construction	Skilled Labor: Bricklayers	Skilled Labor: Carpenters	Skilled Labor: Structural Ironworkers	Equipment Operators: Tractor	Equipment Operators: Power Shovel	Equipment Operators: Air Compressor
Atlanta								
Baltimore	Mar 31: 15¢	Mar 31: 15¢	Apr 1: 15¢	Apr 1: 10¢ Oct 1: 20¢				
Birmingham								
Boston	April 1: 15¢	"	Apr 1: 5¢*	May 1: 5¢	"	"	"	"
Chicago	"	"	"	Jun 1: 10¢	Jun 1: 15¢	"	"	"
Cincinnat								
Cleveland	May 1: 10¢	May 1: 10¢	May 1: 10¢ Jul 1: 7½¢	May 1: 10¢ Jul 30: 10¢	May 1: 10¢	May 1: 10¢	May 1: 10¢ Aug 1: 7½¢	May 1: 10¢
Dallas								
Denver								
Detroit								
Kansas City	Apr 1: 10¢	Apr 1: 10¢	Apr 1: 10¢	Apr 1: 17½¢	Apr 1: 15¢	Apr 1: 10¢	Apr 1: 10¢	Apr 1: 10¢
Los Angeles								May 1: 15¢
Minneapolis	May 1: 15¢		May 1: 15¢	May 1: 15¢	May 1: 15¢			
New Orleans	May 1: 5¢ Nov 1: 5¢	May 1: 5¢ Nov 1: 5¢	May 1: 5¢ Nov 1: 10¢	May 1: 10¢ Nov 1: 10¢	May 1: 10¢ Nov 1: 10¢	May 1: 10¢ Nov 1: 10¢	May 1: 10¢ Nov 1: 10¢	May 1: 10¢ Nov 1: 10¢
New York	Jul 1: 20¢	Jul 1: 20¢	Jul 1: 15¢	Jul 1: 20¢	Jul 1: 15¢	Jul 1: 15¢	Jul 1: 20¢	Jul 1: 20¢
Philadelphia				May 1: 15¢	Jul 1: 12½¢			
Pittsburgh	Jun 1: 12½¢	"	Jun 1: 10¢	Jun 1: 10¢ Dec 1: 10¢	Jul 1: 15¢	"	"	
St. Louis	May 1: 15¢	May 1: 15¢	May 1: 15¢	May 1: 15¢	May 1: 15¢	May 1: 15¢	May 1: 15¢	May 1: 15¢
San Francisco	May 1: 15¢	May 1: 15¢	"	"	"	"	"	"
Seattle								

* pension fund increase of 3¢ — negotiating new contract now

Money: Prudent Timing Can Save Interest Costs

Contractors and construction buyers need to watch closely this year a fourth basic cost factor: the cost of borrowing money. Interest rates have been riding a roller-coaster since 1957. The underlying trend is up.

Higher interest raises costs of financing equipment and obtaining working capital loans. Homebuilders must pay greater discounts to banks that buy government-insured mortgages.

Construction buyers are paying higher interest on some long-term borrowings than at any time since the early thirties. Interest costs can double the final cost of new construction, depending on the terms.

Huge federal debt financing in 1959 will keep investors on their toes and borrowers on edge. But business is borrowing less this year than last and plowing more cash into government securities.

With states and municipalities upping their capital needs in this year, total demand should rise. However, the supply of funds also will increase. So long-term borrowing costs may not range much higher than they are now.

Because increased taxes are making tax exempt bonds more attractive to investors, municipal borrowers may feel less of a financing cost push.

Long-Term Bonds*

Year	Per cent yield to maturity: US Treas.	Municipal	Industrial	Public Utility	Railroad
1929	3.60	4.27	5.01	4.96	4.67
1931	3.34	4.01	4.79	4.57	4.42
1939	2.41	2.76	2.64	2.83	3.39
1945	2.34	1.67	2.50	2.59	2.75
1946	2.19	1.64	2.44	2.50	2.59
1949	2.28	2.21	2.53	2.69	2.71
1954	2.51	2.34	2.73	2.95	2.91
1955	2.80	2.53	2.97	3.10	3.03
1956	3.06	2.93	3.34	3.42	3.39
1957	3.47	3.60	3.90	3.99	3.94
1958	3.23	3.56	3.65	3.86	3.89
1959:					
Feb	3.91	3.85	4.02	4.28	4.15

Short-term Business Loans=

Year	New York City	7 Other Northern & Eastern Cities	11 Southern & Western Cities
1929	5.76	5.82	5.93
1931	3.82	4.26	4.90
1939	2.15	3.03	3.62
1945	2.20	2.55	2.80
1946	1.84	2.51	2.97
1949	2.35	2.86	3.17
1954	3.31	3.61	3.98
1955	3.30	3.55	3.95
1956	3.97	4.15	4.38
1957	4.23	4.39	4.65
1958:			
Jun	3.88	4.17	4.58
Dec	4.29	4.50	4.79

* Standard & Poor's data; Taxable Treasury bonds. Federal Reserve Bd. series on partially tax exempt bonds shown for years 1929-39 had 1945 value of 1.66%; high grade municipal bonds; A1+ grade industrial, utility and railroad bonds.

= Federal Reserve Board data for June. New series 1949 to date; two former series cover up to 1938 and 1939-48 and are not strictly comparable.

SOMETHING NEW UNDER THE GROUND

Revolutionary I-R

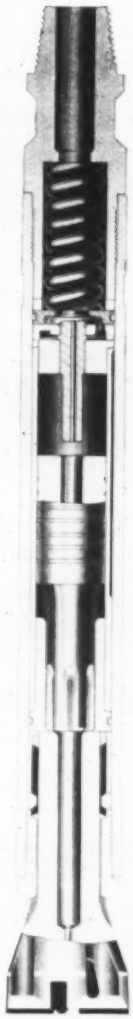
"DOWNHOLE" DRILL

service-proved on millions of feet of hole,
now available in FOUR SIZES,
with constant, thru-the-bit hole cleaning!

The I-R DOWNHOLE drill is a rugged, heavy-duty, sub-surface percussion drill that delivers full striking power *right at the bit*. Hundreds of units, in operation all over the world, have drilled millions of feet of hole with outstanding records of performance and economy.

Designed for use with Ingersoll-Rand Drillmaster and Quarrymaster drilling rigs, the DOWNHOLE drill is also available to present users of other types of rotary drilling equipment. Conversion from roller cone bits to DOWNHOLE drilling is simply a matter of screwing the drill to the rod or adapter and adding an air-line lubricator.

Here are some of the features that put the DOWNHOLE drill in a class by itself.



PATENTED HOLE CLEANING. All operating air is exhausted through the bit and additional *high-pressure air* blows continuously through the bit for maximum hole cleaning, even while drill is not running.

RENEWABLE WEAR SLEEVE. The entire unit is encased in a renewable wear sleeve that can be replaced at low cost when the outside diameter is worn down. (Patent Pending)

THREADLESS CARSET BIT DESIGN. The service-proved result of years of experimentation and field operation, it has no threads to strip or work loose and no energy loss through a separate connection.

SEALED UNIT. There are no ports in the outside of the drill which could admit abrasive material into the working parts.

CHECK VALVE. An optional check valve can be mounted behind the drill to permit operation under great heads of water—keeps mud and cuttings out of the machine even when the drill is stopped.

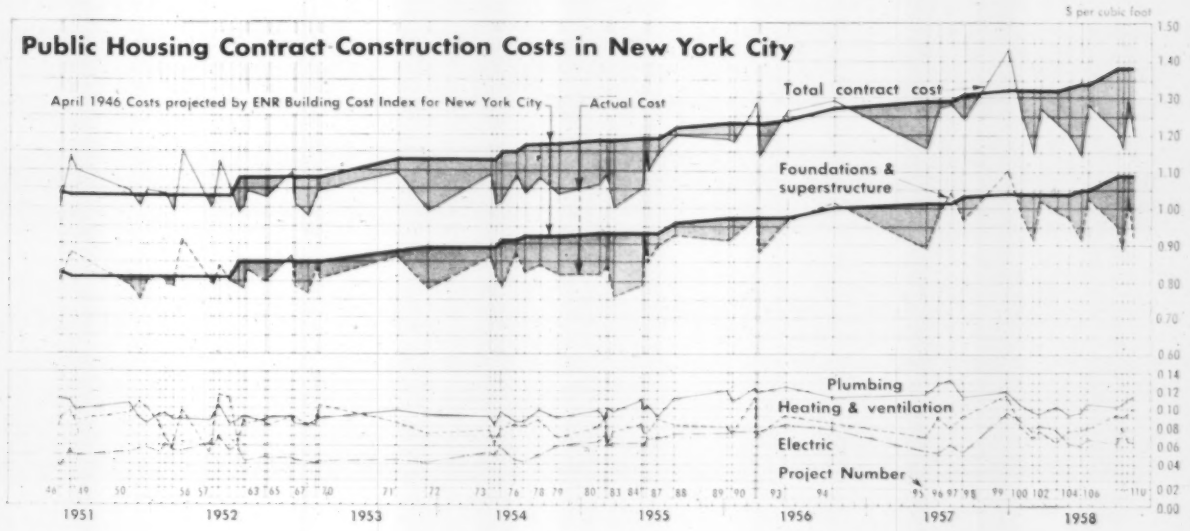
SPECIFICATIONS	DHD-275	DHD-325A	DHD-400	DHD-500
BIT SIZES	4¾" & 5"	6" & 6½"	7" & 7½"	9"
ROD SIZES (O.D.)	4"	4" & 5"	5½"	7"
LENGTH (BIT EXTENDED)	52¾"	52½"	63¼"	68½"
OUTSIDE DIAMETER	4¼"	5⅛"	6"	7¼"
WEIGHT (INCLUDING BIT)	158 lb.	236 lb.	362 lb.	586½ lb.

For further details, send for a copy of Bulletin 4203.

Ingersoll-Rand
11 Broadway, New York 4, N.Y.

5-864

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK



Public Housing Unit Prices in New York City—1958

Awards by New York City Municipal Housing Authority

Project Number		101	102	103	104	105	106	107	108	109	110
Project		Bushwick a	Hylan a,b	Manhattan-ville a,b	Luna Park a,b	Monroe b	Rosedale a,b	Benjamin Franklin f,b,h	Edgemere a	Baisley Gardens a,f,h	Baisley Park b,g
Total constructed rooms	No.	5,070	814	5,369	6,550	4,755	1,684	2,756	5,984	876	1,611
Total apartments	No.	1,220	205	1,272	1,576	1,102	408	691	1,395	216	388
Rooms per apartment	Av. No.	4.63	4.47	4.71	4.66	4.81	4.63	4.49	4.78	4.55	4.67
Total cubage	CuFt.	11,288,105	1,878,400	11,967,873	15,589,794	10,177,348	3,586,268	6,388,744	13,059,718	2,088,205	3,529,560
Bid date		2-4-58	2-4-58	4-29-58	5-3-58	6-17-58	6-17-58	9-9-58	9-30-58	10-21-58	10-21-58
Cost per:											
Total contract		$12,998,626	$2,383,512	$14,708,044	$18,730,532	$11,626,584	$4,582,117	$7,730,317	$15,076,227	$2,629,947	$4,227,303
Constructed room		2,563.53	2,928.14	2,739.44	2,859.62	2,445.14	2,720.97	2,804.90	2,519.92	3,059.30	2,624.05
Apartment		10,654.61	11,626.89	11,562.93	11,884.86	10,550.44	11,230.68	11,187.13	10,809.48	12,167.16	10,951.72
Cubic foot		1.1515	1.2687	1.2290	1.2015	1.1424	1.2777	1.209	1.155	1.2883	1.1977
Foundations & superstructure		10,279,008	1,912,863	11,798,867	15,130,082	9,229,635	3,672,365	6,088,453	11,941,490	2,122,366	3,237,843
Constructed room		2,027.44	2,349.95	2,197.59	2,309.94	1,941.04	2,180.74	2,209.16	1,920.70	2,423.02	2,009.83
Apartment		8,425.39	9,331.04	9,275.86	9,600.31	8,375.35	9,000.90	8,811.08	8,559.06	9,929.70	8,388.29
Cubic foot		0.9106	1.0183	0.9858	0.9705	0.9069	1.0240	0.953	0.8800	1.0204	0.9173
Heating and ventilation		276,029	144,171	290,000	1,195,000	294,950	282,950	583,821	1,169,000	190,581	356,119
Constructed room		153.09	177.11	141.55	182.44	167.06	167.84	211.84	195.35	217.66	221.25
Apartment		636.09	706.27	597.18	758.25	720.52	693.75	844.80	897.69	882.32	923.56
Cubic foot		0.0052	0.0767	0.0606	0.0767	0.0781	0.0788	0.091	0.0900	0.0916	0.1010
Electrical construction		818,573	151,527	934,000	968,150	622,154	245,546	380,741	1,049,000	137,727	229,271
Constructed room		197.33	186.16	174.01	147.85	140.84	143.51	116.51	175.30	157.22	142.22
Apartment		665.39	739.16	734.59	614.59	564.57	601.83	551.05	751.97	637.64	593.97
Cubic foot		0.0752	0.0806	0.0781	0.0621	0.0611	0.0685	0.063	0.080	0.0662	0.0650
Plumbing		1,065,126	174,951	1,214,777	1,437,000	980,143	351,556	654,259	1,367,237	229,071	393,525
Constructed room		216.00	214.93	226.26	219.36	206.19	226.58	237.39	228.57	261.50	250.62
Apartment		867.64	853.42	955.01	911.80	889.70	935.18	946.81	980.46	1,060.52	1,016.19
Cubic foot		0.0970	0.0931	0.1015	0.0922	0.0963	0.1064	0.1020	0.1050	0.1101	0.1114
Piling, abnormal foundations		240,000	120,000	445,000	770,000	1,221,000	547,000	654,000	2,495,000	193,000	100,000

•a state-aided project •b federally-aided •c housing without cash subsidy •d cost of Baisley Park common facilities •e proportionate part of boiler cost included •f in addition, this project is charged with $65,641.44 for share of common facilities included in cost •g includes $65,641.44 charged to Baisley Gardens project for share of •h city-aided program •i not included in above costs

Housing Costs Up, Mechanicals Down

Public housing prices in New York City moved up 1.9% in 1958 to a weighted average of $1.191 per cu ft for 79.55 million cu ft of mass housing in ten projects.

But the lowest cube cost of $1.1424 is 5% above its 1957 counterpart and the highest, at $1.2883, is up only 1.8%. The New York Building Cost Index was up 3% on the average but 5% in October when two of these projects were let.

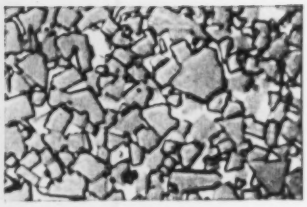
The most notable difference in this year's costs is the lower percentage of this housing dollar that was taken by the mechanicals. Plumbing is down to 8.425% in 1958 compared to 10.355% in 1957. Electrical construction is 5.39% compared to 6.235% and heating and ventilating is 6.605% as against 6.91%. These are median ratios.

The maximums and minimums follow this same pattern for the most part, except that the minimum electrical ratio is higher in 1958. Mechanicals costs per cu ft also dropped, except for heating and ventilating maximum and electrical construction minimum.

Not included in the contract price reported here are costs of piling or abnormal foundations. These added from 1.85% to 16.55% to the contract price shown for the structure alone.

	Heat & Vent			¢ cu ft		
	Max	Med	Min	Max	Med	Min
	¢	¢	¢	¢	¢	¢
1958	8.43	6.605	5.17	10.10	7.85	6.36
1957	8.98	6.91	6.39	9.46	8.33	7.10
	Electrical			¢ cu ft		
1958	6.96	5.39	5.14	8.06	6.71	6.11
1957	7.88	6.235	4.30	8.30	7.55	5.32
	Plumbing			¢ cu ft		
1958	9.55	8.425	7.34	11.41	10.75	9.22
1957	10.81	10.355	9.13	13.20	12.60	10.80

Longer bit life— with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities —therefore stronger, longer-lived.

Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels — the most widely used in the world — and Sandvik Coromant extension steel equipment.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Available Diameters, in Inches

Type	Thread	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	TAPER	x	x	x	x													
	F		x	x														
	113		x															
	H			x	x	x	x	x		x								
	115			x	x													
	D						x	x	x	x	x	x	x	x				
	K													x	x	x	x	
BOTTOMING	1" Rope				x	x	x	x		x								
	1¼" Rope						x	x	x	x		x		x				
	400						x	x		x		x						
	1½" Rope											x	x	x	x	x		
	600											x	x	x	x			
	700													x	x			
	J 7.5															x	x	
	2" Rope														x	x	x	x
	1000																x	

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
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Atlas Copco

930 Brittan Avenue
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Do-It-Yourself Cost Estimator

To give citizens and school officials an immediate insight into what proposed new schools will probably cost, Connecticut Public Expenditure Council, Inc., Hartford, has issued a guide and a work sheet for "Determining Areas and Approximate Cost of Schools."

It was prepared for the council by Wood & Sibbert, consulting engineers, Cos Cob, Conn.

The guide is designed to deal realistically with costs at the start and prevent later state of shock and the costly delays the cost estimate sometimes causes.

At 1959 cost levels, here are the guides given on what to expect in unit costs per sq ft:

High Average	$20.60 *highest cost fifth*
Mid-range	$16.70 *average*
Low Average	$13.20 *lowest cost fifth*

These figures are based on actual prices for schools built in Connecticut in 1956 and 1957, but have been adjusted to 1959 levels.

The Mid-range Average is based on schools having the following characteristics:

Excavation—Small amount of rock.

Structure—Steel, semi-fireproof, slab on grade.

Roof—Fireproof deck, insulation, 20 year bonded roof, no skylights or bubbles.

Exterior Walls—Brick, masonry, or sandwich panels and glass; some architectural stone trim.

Windows—Galvanized steel, projected or double hung.

Doors—Entrances, stainless steel or aluminum. Other doors, wood.

Interior Partitions—Unplastered, block, or painted.

Floors—Asphalt tile, 1 in. on slab on grade.

Ceilings—Acoustical fibre tile or exposed acoustical roof deck.

Plumbing—Copper tubing, floor type fixtures.

Heating and Ventilating—Steam or hot water, direct radiation or unit ventilators, mechanical exhaust, individual room controls.

Electrical—Fluorescent lights, simple public address system, fire detectors, simple stage lighting, battery emergency lights as required.

Kitchen Equipment—Stainless steel, iron ranges and ovens.

• **How work sheet works**—The work sheet has both a long and a short form. You select which one you prefer to use.

WORK SHEET

For Determining Areas and Approximate Cost of Schools

Date
Name of School
Grades to
Town

For Discussion of This Work Sheet See C.P.E.C. Guide: How To Estimate The Cost of Your Proposed School

Planned Number of Pupils:
Initial Building
Future Addition
Ultimate Building

	TO GET MAXIMUM STATE AID			PROPOSED FOR YOUR SCHOOL				COMPUTED RESULTS		
	Number Rooms Per Item	Min. Square Feet Per Pupil	Min. Square Feet Per Room	Number Rooms Per Item	Square Feet Per Pupil	Pupils Per Room	Number of Rooms Needed (Space ÷ Size)	GROSS AREA (Total Square Feet)	COST (Building A + B + C, Sum Amounts, Per Unit of Work Used.)	Grade Area Assignment or Number of Pupils
	1	2	3	4	5	6	7	8	9	10
DETAILED FORM — FOR FIGURING CLASSROOM AREA										
A. Classroom Areas										
Regular Classrooms — Elementary	30	x 25	= 750		x	=	x =		$	
Regular Classrooms — Secondary	25	x 25	= 625		x	=	x =			
Kindergarten Rooms	25	x 35	= 875		x	=	x =			
Laboratory Areas										
Arts and Crafts	25	x 35	= 875		x	=	x =			
Bookkeeping	25	x 30	= 750		x	=	x =			
Drafting	25	x 35	= 875		x	=	x =			
English	25	x 35	= 875		x	=	x =			
Industrial Arts, Elementary										

Spaces in this work sheet provide for deviations from standards shown

It provides the working ratios for estimating space requirements "to get maximum state aid."

The six components of this estimate of "Approximate Cost of Schools" are:

A. Classroom areas.

B. Other education areas.

C. Service and structure areas.

D. Cost of professional fees and equipment.

E. Cost of site.

F. Cost of development.

A. On the short form, classroom areas are figured on these ratios:

Type of Classrooms	sq ft per pupil
Average: Elementary	30
Secondary	35
Proposed for your school	.....

On the long form, this goes into detail by classroom use:

Type of Classroom	No. of pupils per rm.	Sq ft per pupil	Min. sq ft. per rm.
Regular, Elementary	30	25	750
Secondary	25	25	625
Kindergarten	25	35	875
Laboratory areas			
Arts and Crafts	25	35	875
Bookkeeping	25	30	750
Drafting	25	35	875
English	25	35	875
Industrial Arts, Elementary			
Junior High	25	50	1250
Senior High	25	75	1875
Homemaking	25	35	875
Homemaking, All-purpose	25	55	1375
Languages	25	35	875
Mathematics	25	35	875
Office Practice	25	30	750
Retailing	25	30	750
Social Studies	25	35	875
Science	25	35	875

For the number of rooms needed, check with the superintendent.

B. On other education areas these ratios are recommended:

Education Area	Sq ft per pupil Elementary	Sq ft per pupil Secondary	Your School
Administration	2.5	3.0	.....
Cafeteria and kitchen (Capacity 1/3 student body)	5.0	5.0	.....
Gymnasium & locker space	6.0	10.0	.....
Auditorium & stage (Capacity 1/2 student body)	7.0	8.0	.....
Multi-purpose room & stage	5.0	5.0	.....
Library	1.5	2.0	.....
Music		2.5	.....
Educational storage	1.0	1.5	.....
.....	.....	.....	.....
.....	.....	.....	.....

C. Service and structure areas include corridors, toilets, boiler room, building walls, etc.

To estimate this space add up your classroom (A) and other educational (B) space and multiply by these factors:

Service and Structure Areas Type of School	Multiply A + B space by this factor	
Elementary	0.35 ×	sf
Secondary	0.45 ×	sf
Your School	×	sf

D. Professional fees and equipment is figured as a percentage of total building cost.

Add up total A + B + C space in sq ft, multiply it by the selected cost per sq ft to get estimated total Building Cost.

Professional Fees and Equipment Type of School	Multiply A + B + C × $ sf Total Building Cost by these factors	
Elementary	0.11 × $	.....
Secondary	0.13 × $	
Your School	× $	

A.F. The total cost of the school is:

A + B + C sf × $ sf + D$ + E$ + F$ = Total $

The work sheet provides space where each area can be multiplied separately by the cost per sq ft. This makes it practical to add or subtract areas as needed to balance the school cost budget. The average over-all unit costs per sq ft are close enough for this purpose, say the engineers, even though applied to different types of space usage.

Unit Prices of Schools Built in Chicago

Chicago Board of Education, Bureau of School Population and Facilities Survey, T. J. Higgins, Director

Name		Grade	Contract date	ENR BC Index Chi	ENR BC Index 20 C	Space per Pupil sq ft	Space per Pupil cu ft	Capacity pupils	Unit Cost per $ sq ft	Unit Cost per $ cu ft	Unit Cost per $ pupil	% of Cost by Trades General	Plumbing	Heating	Ventilating	Temp Contr	Pipe Cov	Electrical
Kinzie		K-8	2 56	493	483	52 6	842	1,045	16 75	1 047	823	63 20	7 74	8 58	5 23	1 71	1 08	12 45
Carnegie		K-6	2 56	493	483	44 7	746	925	18 04	1 080	806	61 75	7 62	9 92	5 40	1 31	0 80	13 71
Anthony		K-6	2 56	493	483	39 9	725	365	20 96	1 153	837	59 70	8 95	10 30	7 10	1 75	1 17	11 03
Carpenter		K-8	3 56	493	483	48 7	829	1,780	18 64	1 096	909	62 01	6 85	9 92	5 40	1 31	0 80	13 71
Drew		K-5	4 56	498	486	51 6	838	790	17 67	1 090	911	63 01	7 64	8 64	5 13	1 53	0 73	13 33
Bartelme		K-Pri	6 56	500	489	39 3	738	435	18 97	1 010	747	59 17	9 23	11 36	5 74	1 92	1 07	11 50
Sheldon	OA	K-4	10 56	507	500	49 7	584	245	15 53	1 320	772	72 30	6 10	14 60				7 00
Dore	OA	K-5	10 56	507	500	45 6	558	245	17 89	1 460	817	70 93	7 09	12 54	1 94			7 48
Reavis	OA	K-6	11 56	507	500	45 4	621	550	14 00	1 020	636	72 45	10 90	6 33	1 86			8 44
Attucks	OA	K-8	11 56	507	500	50 5	683	1,470	16 51	1 240	841	62 20	8 40	17 90	4 10			6 40
Decatur	OA	K-Pri	12 56	506	500	45 1	703	490	20 32	1 310	919	75 96	5 22	11 79	2 47			4 54
Pershing	OA	K-Pri	5 57	507	503	58 6	682	490	16 70	1 440	976	69 00	6 20	7 80	11 40			6 60
Earhart		K-6	6 57	511	504	51 2	763	260	17 76	1 180	906	66 50	8 15	10 32	4 52	2 03		8 48
Mason	Adn	7 8	8 57	530	517	48 6	583	1,190	13 61	1 140	662	66 90	5 70	11 90	7 20			8 30
Brown	Adn	K-6	7 56	502	489	32 7	516	420	18 35	1 164	601	67 27	6 36	11 02	2 78		1 19	11 38
Coonley (Assemb-Gym)	Adn	K-8	8 56	500	491				25 47	1 1925		59 70	11 20	8 70	8 46			12 02
Raymond	Adn	K-8	11 56	507	500	53 0	725	1,045	16 00	1 170	820	60 33	6 50	10 42	6 60			16 15
Jenner	Adn	K-8	1 57	506	502	45 8	586	1,260	16 15	1 200	660	62 10	7 57	4 98	7 09			16 28
Beale		7 8	5 57	507	503	40 4	493	1,260	15 18	1 240	613	71 70	5 90	12 90	2 90			6 60
Dunbar		Voc HS	4 55	471	461		1,920	2,500		1 110	2,062	60 00	6 40	18 10				15 60
Harlan		9 12	4 57	505	501	80 0	1,124	2,000	20 41	1 440	1,625	63 80	6 90	9 36	6 06			13 98
Taft	Adn	9 12	10 56	507	500	92 8	1,571	920	19 90	1 180	1,737	70 30	8 12	5 65	5 84		0 73	12 36

OA Outside Architect other schools by Board of Education Architectural Department Adn Addition Engineering News-Record Building Cost Index, March, 1959: Chicago 569 20-cities Average 540

Chicago Analyzes Costs for New Schools

Chicago's intensive school building program has produced some cost and space ratios not usually available for analyzing unit costs. Costs of ventilation, temperature control and pipe covering, for example, are shown separately for individual schools.

The contract prices for new elementary schools range from $13.61 to $20.96 per sq ft, the corresponding cube price range of $1.01 to $1.46 per pupil contract prices range from $636 to $976.

For school additions this range is $16.00 to $25.47 per sq ft, $1.164 to $1.20 per cu ft and $601 to $820 per pupil.

High schools check in the range at $19.90 to $20.41 per sq ft, $1.32 to $1.35 per cu ft and $1,625 to $2,062 per pupil.

Space per pupil ranges from 39.3 to 58.6 sq ft in new elementary schools, from 32.7 to 53 sq ft in additions and from 80 to 92.8 sq ft per pupil in high schools.

Heating and ventilating accounts for 8.19% to 22% of the new school dollar in elementary schools, including temperature controls that range from 1.30% to 2.03% and pipe covering that ranges from 0.73% to 1.17%.

In additions, heating and ventilating takes 12.06% to 17.16% of the total and in high schools, 12.22% to 18.10%.

Plumbing is 5.22% to 10.9% of the new elementary school cost, 6.36% to 11.2% of additions and 6.4% to 8.12% of high school costs.

Electrical work ranges from 4.54% to 13.7% on new elementary schools, from 11.38% to 16.28% on additions and from 12.36% to 15.6% on high schools.

The general building contract for new elementary schools runs from 59.17% to 75.96% of the cost; on additions from 59.70% to 67.27%; and on high school contracts from 60% to 70.3%.

Only one junior high school is included in this study. It provides 40.4 sq ft of space per pupil and costs $15.18 per sq ft, $1.24 per cu ft and $613 per pupil. Heating and ventilating takes 15.8% of the total cost, plumbing takes 5.9% and electrical work takes 6.6%. The general contract accounts for 71.7%.

These Chicago schools range in capacity from 245 to 1,780 pupils in the elementary grades, 1,260 for the junior high school and 2,000 to 2,500 for the high schools. The elementary school additions added pupil capacity ranging from 420 to 1,260.

The dollars shown in the accompanying tables are all contract dollars for the date shown. The Building Cost Indexes for those dates are also shown to permit time and location adjustments to widen the usefulness of these prices.

The individual schools table shows how space use and prices vary from school to school. The summaries give the ranges and medians, the patterns into which these space and price data fit.

These data are available through the courtesy of Chicago's Board of Education, and T. J. Higgins, Director of its Bureau of School Population and Facilities Survey.

Chicago has 29 new buildings and 22 more additions in the planning stage for future construction.

How Space per Pupil Works Out

Kind of School	No. of Schools	Sq ft per pup Max.	Sq ft per pup Med.	Sq ft per pup Min.
K + new	14	58 6	48 65	39 3
additions	3	53 0	45 8	32 7
High Schools	2	92 8		80 0
		Cu. ft. per pupil		
K + new	14	842	714	558
additions	3	725	586	516
High Schools	3	1,920	1,571	1,124

How the Unit Costs Run

Kind of School	No.	$ per sq ft Max.	$ per sq ft Med.	$ per sq ft Min.
K + new	14	$20 96	$17 72	$13 61
additions	4	25 47	17 20	16 00
High Schools	2	20 41		19 90
		$ per cu. ft.		
K + new	14	$1 46	$1 15	$1 01
additions	4	1 20	1 181	1 164
High Schools	3	1 35		1 32
		$ per pupil		
K + new	14	$976	$830	$636
additions	3	820	660	601
High Schools	3	2,062	1,737	1,625

Cost Ratios for Mechanicals

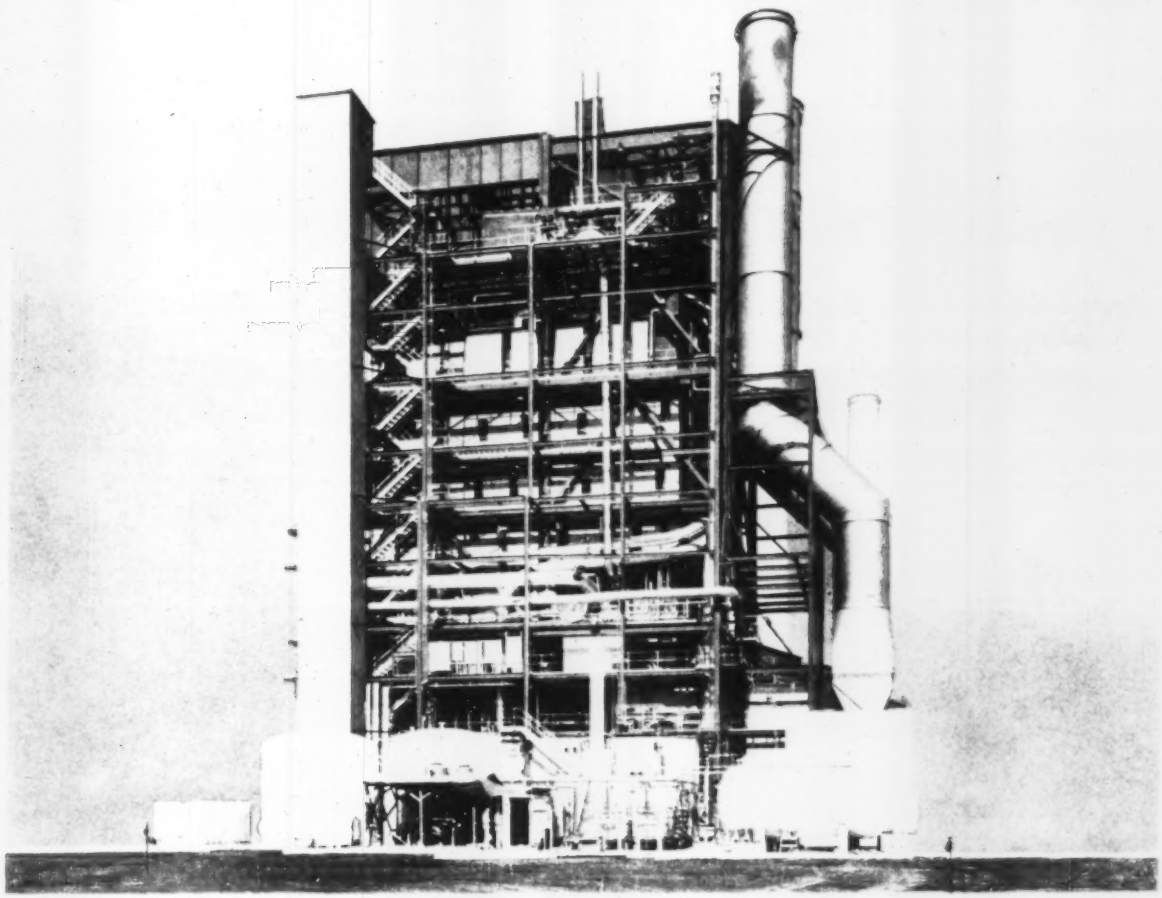
Type of School	No. of Schools	% of Total Cost to General Contract Max.	Med.	Min.
		Plumbing		
K + new	14	10 90	7 63	5 22
additions	4	11 20	7 04	6 36
High Schools	3	8 12	6 80	6 40
		Electrical		
K + new	14	13 70	8 46	4 54
additions	4	16 28	14 09	11 38
High Schools	3	15 60	13 98	12 36
		Heating & Ventilating*		
K + new	14	22 00	17 15	8 19
additions	4	17 16	16 01	12 06
High Schools	3	18 10	15 42	12 22

* Includes temperature control and pipe covering

MEMO To: **CORROSIVE ENGINEERS**

From: **AVONDALE** (AVONCRAFT DIVISION)

Subject: **VERSATILITY AND PORCELAIN ENAMEL**



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tough schedule—proves again

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GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

GULF

Gulf man on the job checks fuel and lubrication requirements with Ryan Graham, Ballenger Paving Superintendent. On the left, Ernest L. Trowell, Gulf Sales Representative.

SP-9525

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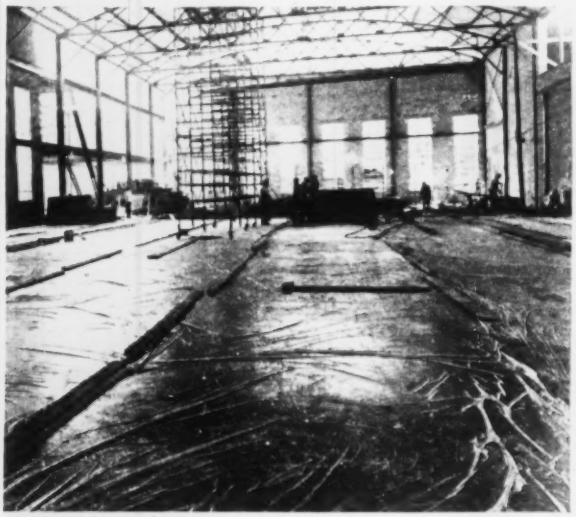

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1st Quarterly Cost Roundup

Where the Building Dollar Goes

[This is the eleventh report in the series. Earlier reports were published in ENR Oct. 8, 1953; Sept. 29, 1955; July 5, 1956; Aug. 2, 1956; Dec. 1956; Oct. 17, 1957; Mar. 20, 1958; Sept. 18, 1958; Dec. 25, 1958.]

Unit and Ratio Costs Supplied through the Courtesy of Vogel Bros. Building Co., Madison, Wis.; Security Construction Co., Salt Lake City, Utah; Commercial Construction Co., San Antonio, Tex.; Balay Construction Co., Mercedes, Tex.; Siesel Construction Co., Milwaukee, Wis.

TYPE OF: Building Construction: frame walls	Primate Lab.		Warehouse Block Brick		Warehouse Rigid stl frame Sheetmetal		Telephone Exchange Reinf. concrete Brick		Public Housing, Tex. 65-2 Brick				Office Bldg. Conc.& Steel Brick & Metal	
Date construction started	July, 1957		1956		Dec., 1958		Jan. 1958		Sept. 1957				May 1957	
Location, city	Madison, Wis.		Salt Lake City, Utah		Sherman, Tex.		Abernathy, Tex.		Harlingen, Tex.				Milwaukee, Wis.	
SIZE OF BUILDING:	2 & basement, penthouse		1		1		1		61 Bldgs, 1 story each				8	
Height, stories	18,092 sf		6,000 sf		17,400 sf		1,286 sf		Approx. 2,000 sf each				100,765	
Floor area, sq ft	240,682 cf		120,000 cf				18,144 cf						1,473,269	
Volume, cu ft														
% air conditioned	0%		0%		0%		0%		0%				12%	
RANGE OF COST of this type of building:	Avg.				Actual		Avg.		Min.	Avg.	Actual			
Cost, $ per sq ft	$15.64				$2.73		$16.80		$8.00	$10.00	$12.00			
$ per cu ft	$1.175						1.20							
Cost, $ per unit of capacity									$10,000	$12,000	$14,000			
ENR BUILDING COST INDEX (1913=100)	507		491		535		517		516				503	
PRINCIPAL ITEMS OF COST	$ and % of Total Cost													
	$	%	$	%	$	%	$	%	$	%	%	%	$	%
Excavation & Site Improvements	3,680	1.30	2,365	6.66	1,126	2.66	90	0.40	11,030	1.25	1.22	1.59	31,574	1.74
Foundations	9,630	3.41	5,147	13.90	11,076	23.24	1,671	7.67	124,093	11.31	11.26	10.85	55,053	3.02
Structural Frame	25,162	8.90	3,236	8.74	20,247 c	43.61	1,323	6.07	91,550	8.65	8.58	8.27	357,312	19.62
Cement Finish Work	34,376	12.15			1,740	3.65	129	0.60	3,000	0.27	0.27	0.26	In struct frame	
Exterior Masonry	33,617	11.88	5,200	14.04			4,096	21.55	134,349	12.28	12.19	11.75	92,370	5.07
Metal Wall Panels			1,709	4.61									95,840	5.26
Interior Partitions	7,058	2.50	500	1.35	2,288	4.80							45,373	2.49
Carpentry & Millwork	6,486	2.29	2,205	5.95	972	2.04	599	1.84	18,300	1.67	1.66	1.60	18,742	1.03
Sash & Glazing	195	0.07	1,038	2.80	110	0.23			In hollow metal work				16,869	0.93
Doors			325	0.88	2,300	4.83	711	3.26	2,700	0.25	0.24		In millwork & hollow met work	
Roofing	4,415	1.56	610	1.65	In steel frame		765	3.51	135,135	12.36	12.27	11.82	8,685	0.48
Insulation			200	0.54									3,450	0.19
Waterproof & Dampproofing							125	0.57	3,125	0.29	0.28	0.27	550	0.03
Metal Lath, Fur & Plastering	292	0.10	300	0.81					89,331	8.17	8.11	7.80	22,112	1.21
Hollow Metal Work									58,617 d	5.36	5.32	5.13	8,927	0.49
Misc. Iron & Ornamental Metal			85	0.23			1,285	5.89	1,650	0.16	0.15	0.14	26,434	1.45
Tile, Terrazzo & Marble	3,100	1.10	115	0.31					8,650	0.79	0.78	0.76	25,000	1.37
Floor Covering			347	0.94	623	1.31	268	1.23	25,803	2.36	2.34	2.26	15,166	0.85
Painting	6,714	2.37	944	2.55	422	0.88	600	2.75	45,631	4.17	4.14	3.99	9,203	0.50
Finish Hardware	3,700	1.31	150	0.40	273	0.57	120	0.55	63,835	5.84	5.80	5.58	9,443	0.52
Acoustical Ceilings	621	0.22	325	0.88									82,260	4.52
Plumbing	38,327	13.55	1,000	2.70	1,623	3.41	1,220	5.60	126,000	11.52	11.44	11.02	75,530	4.15
Heating, Ventil & Air Condition	54,983 a	19.44	5,430	14.69			5,200	23.86	18,920	1.73	1.72	1.65	503,167	27.63
Electric Work & Lighting Fixts	21,857	7.73	2,496	6.75	1,322	2.77	3,192	14.65	51,160	4.65	4.64	4.74	167,135	9.18
Elevators	15,953 b	5.64											75,214	4.13
Special Service Equipment									5,630	0.51	0.51	0.49		
Sheet Metal													25,972	1.43
Cold Room & X-ray Material	12,710	4.48												
Concrete Floors			3,190	8.62										
General Conditions									39,170	3.58	3.55	3.43	49,969	2.72
Total	$282,880	100.0%	$37,030	100.0%	$47,662	100.0%	$21,795	100.0%	$1,093,671	100.0%			$1,821,165	100.0%
Bond									8,393		0.76	0.76		
Street Work									31,196			3.60		
Total Cost	$282,880	100.0%	$37,030	100.0%	$47,662	100.0%	$21,795	100.0%	$1,133,260	100.0%	100.0% g	100.0% h	$1,821,165	100.0%

a Sheet metal b Incl dumbwaiters c Incl sheeting d Incl window and door frames e Incl sash f Incl bond g Incl bond and street work h 20 Cities

Where School and Dormitory Dollars Go

Unit and Ratio Costs Supplied through the Courtesy of Earl K. Rosti, Inc., Falls Church, Va., Vogel Bros. Building Co., Madison, Wis., Cloud Construction Co., Temple, Tex.; Christiansen Bros., Salt Lake City, Utah; Wasatch Electric Co., Salt Lake City, Utah; A & B Plumbing & Heating Co., Salt Lake City, Utah; H. A. Kuljian & Co., Philadelphia, Pa.

TYPE OF: Building Construction: frame outside walls	High School Steel Brick	High School Concrete Brick	Jr. High School	Elementary School Steel Brick	Women's Dormitory Reinf conc Brick
Date construction started	Nov. 1958	April 1957	Oct. 1957	Nov. 1957	Jan. 1959
Location, city	Gatesville, Tex.	Salt Lake City, Utah	Madison, Wis.	Fairfax County, Va.	E. Stroudsburg, Pa.
SIZE OF BUILDING:					
Height, stories	1	2	2	2	2 stories, 40 ft one end, 35 ft other end
Floor area, sq ft	40,000 sf	127,808	45,428 sf	30,566 sf	49,720 sf
Volume, cu ft	550,000 cf	1,567,920	646,758 cf	405,296 cf	532,700 cf
RANGE OF COST of this type of building	Actual	Actual	Avg.	Min. Avg. Max Actual	Actual
Cost, $ per sq ft	$9.847	$12.77	$12.51	$11.90 $13.00 $15.00 $11.90	$13.65
$ per cu ft	$0.716	$ 1.04	$0.879	0.90	$ 1.28
Cost, $ per unit of capacity	.....	.....	.....	$758.10 pupil 63.7 sf pupil	$3,410 student
Capacity	.....	.....	.....	.....	200 students
ENR BUILDING COST INDEX (1913 = 100, 20 Cities)	535	501	517	517	536

PRINCIPAL ITEMS OF COST	$ and % of Total Cost									
	$	%	$	%	$	%	$	%	$	%
Excavation & Site Improvements	5,750	1.46	72,365	4.43	9,300	1.66	23,100	6.35	13,060	1.93
Foundations	44,300 a	11.25	61,798	3.79	21,184	3.78	10,000	2.75	In Struct Frame	
Structural Frame	54,969 b	13.70	376,041	23.04	66,811	11.93	45,000 g	12.37	185,200	27.37
Cement Finish Work	3,567	0.91	53,949	3.31	68,795	12.29	6,000 h	1.65	In Struct Frame	
Exterior Masonry	33,063	10.93	190,270	11.66	33,252	5.94	62,000	17.04	96,500	14.26
Metal Wall Panels	769 c	0.20	.....	.....	.....	.....	.....	.....	.....	.....
Interior Partitions	28,042	7.12	In Millwork & Masonry		36,684	6.55	In Masonry		In Exterior Masonry	
Carpentry and Millwork	33,991 d	8.55	167,038	10.23	54,156	9.67	21,500	5.91	63,440 m	9.38
Sash & Glazing	13,342	3.39	5,181	0.32	7,221	1.29	11,500	3.16	34,600	5.11
Doors	.....	.....	In Millwork		.....	.....	2,300 j	0.63	4,878 n	0.72
Roofing	11,775	2.99	21,554	1.32	10,650	1.90	8,000 f	2.20	12,000	1.77
Insulation	2,423	0.63	In Roofing		.....	.....	.....	.....	In Roofing	
Waterproofing & Dampproofing	.....	.....	In Roofing		.....	.....	.....	.....	.....	.....
Metal Lath, Furring & Plastering	15,688	3.98	62,220	3.81	7,721	1.38	5,200	1.43	2,100	0.31
Hollow Metal Work	4,082	1.03	14,439 e	0.88	.....	.....	.....	.....	5,375	0.79
Misc Iron & Ornamental Metal	.....	.....	In Struct Frame		.....	.....	.....	.....	22,404	3.31
Tile, Terrazzo & Marble	1,400	0.36	32,534	1.99	31,498	5.63	6,000 k	1.65	16,030 o	2.37
Floor Covering	6,180	1.57	25,896	1.58	.....	.....	6,000	1.65	9,000 p	1.33
Painting	10,056	2.55	25,762	1.58	11,300	2.02	7,000	1.92	14,800	2.19
Finish Hardware	7,102	1.80	In Millwork		6,644	1.19	9,500	2.61	17,000	2.51
Accoustical Ceilings	643	0.16	50,658	3.10	22,315	3.99	10,500	2.88	7,302	1.08
Plumbing	58,082	14.74	52,515	3.22	24,745	4.42	90,000	24.73	54,333 q	8.03
Heating & Ventilating	20,456	5.19	204,570	12.53	69,167	12.35	In Plumbing		46,600	6.89
Electrical Work & Light Fixtures	.....	.....	103,895	6.37	51,833	9.26	24,500	6.73	52,238	7.72
Dumbwaiter	.....	.....	.....	.....	.....	.....	.....	.....	5,302	0.78
Kitchen, Gym, Stage, etc	5,117 e	1.30	.....	.....	18,354	3.28	.....	.....	840 r	0.12
Chalkboards	.....	.....	.....	.....	.....	.....	5,800	1.59	.....	.....
Modernfold door	.....	.....	.....	.....	.....	.....	.....	.....	200	0.03
Electric Folding Partition	.....	.....	16,310	1.00	.....	.....	.....	.....	.....	.....
Venetian Blinds	.....	.....	.....	.....	.....	.....	.....	.....	1,963	0.29
Fire Extinguishers & Cabinets	.....	.....	.....	.....	.....	.....	.....	.....	600	0.09
Vitreous Wall Surface	.....	.....	.....	.....	.....	.....	.....	.....	3,000	0.45
Macadam	.....	.....	.....	.....	.....	.....	.....	.....	920	0.14
Ceramic & Quarry tile floors, window stools, etc	4,296	1.09	.....	.....	.....	.....	.....	.....	.....	.....
Lockers	.....	.....	28,352 s	1.74	8,250	1.47	.....	.....	.....	.....
Roof Deck, light weight	20,125	5.11	.....	.....	.....	.....	10,000	2.75	.....	.....
Special Laboratory Equipment	.....	.....	20,338	1.24	.....	.....	.....	.....	.....	.....
Fabricated Specialties	.....	.....	46,743	2.86	.....	.....	.....	.....	.....	.....
Toilet Partitions & Assessories	.....	.....	.....	.....	.....	.....	.....	.....	6,975	1.03
Total Cost	$393,898	100.0%	$1,632,338	100.0%	$559,880	100.0%	$263,900	100.0%	$676,660	100.0%

a Incl floors b Incl misc iron c Toilet partitions d Incl wood doors e Gym, lockers, etc. f Incl sheet metal g Incl floor slabs j Metal bucks & toilet partitions
k Ceramic & cast stone m Incl corkboard & trim n Incl frames o Ceramic & glazed structural tile p Resilient q Incl drainage r kitchenette s And basket rack system

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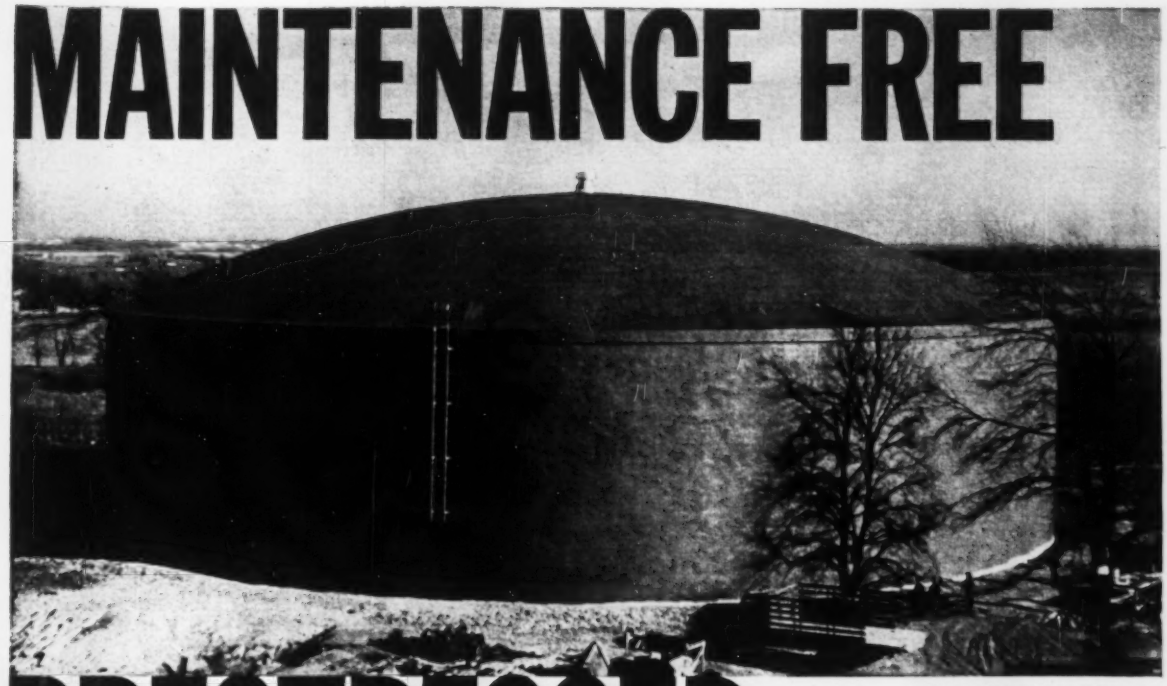

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Montreal 16, Canada

Where the Hospital Dollar Goes

Unit and Ratio Costs through the Courtesy of Hewitt & Royer, Architects & Engineers, Kansas City, Mo.; M. P. Construction Co., Carthage, Mo.; John W. Maloney, Architect, Seattle, Wash.; Cawdrey & Vemo, Inc., Seattle, Wash.

TYPE OF: Building	Hospital	Hospital Additions
Construction, frame	Wall Bearing	Conc & steel
outside walls	Brick, conc backup	Conc & curtain walls
Date construction started	Nov. 1958	Nov. 1958
Location	Aurora, Mo.	Everett, Wash.
SIZE: Number of beds	30	21
Height, stories	1	Three 1-story additions
Volume, cube total cu ft	186,000 cf	22,889 sf new work
Floor area, total sq ft	15,666 sf	4,300 sf remodeling
Distr. of space, % of Total:		
office, administration, incl waiting rooms	9%	20%
patient housing: rooms 1-4	23%	30%
open housing: rooms 5 or more		
operating & special treatmt	20%	35%
food process & laundry	11%	----
bldg functions (corridors, closets, storage, toilets, heating & air conditioning equipment, elevators, stairs, etc.)	37%	15%
MECHANICAL facilities: elevators		1 extended to 1 additional floor
Heating, type	Hot-chilled water	Hot water
Air conditioning, % of space	100%	35%
Power plant	Complete	Complete—not in this contract
Total contract cost	$397,945 (incl curb & gutter & asphalt paving)	$824,128, incl $26,198 sales taxes

RANGE OF COST: of this type of building:	Min.	Avg.	Max.	
Cost $ per sq ft	$23.00	$26.00	$30.00	A complex project involving alterations, parking, additions, so sq & cu ft unit costs are not meaningful
$ per cu ft	1.05	2.50	3.00	
$ per bed	$12,000	$18,000	$21,000	
ENR BUILDING COST INDEX (1913 = 100)		535		535

PRINCIPAL ITEMS OF COST	$ and % of Total Cost					
	$	% excl paving Alt.	% incl paving Alt.	$	% excl bonds, permits & temp plant	% incl bonds, permits & temp plant
Excavation & Site Improvements	10,498	2.89	2.81	23,760 k	3.01	2.98
Foundations & Footings				Included in frame		
Frame	16,817 b	4.63	4.51	106,516 f	13.53	13.35
Floors, concrete, cement finish				Included in frame		
Concrete	16,333	4.50	4.38	.....	.....	.....
Masonry	43,928	12.09	11.78	.....	.....	.....
Ceramic & Quarry Tile	16,232	4.47	4.35	.....	.....	.....
Exterior Walls				Included in frame		
Interior Partitions: permanent				21,915 g	2.78	2.75
Carpentry & Millwork	11,500	3.17	3.09	27,748	3.53	3.48
Window: Sash & Glazing	2,117	0.58	0.57	25,378	3.28	3.18
Meta. Windows	4,747	1.31	1.27	.....	.....	.....
Doors: exterior	Included in interior			Included in sash & glass		
interior	3,850 c	1.06	1.03	Included in millwork		
Roofing	13,676 d	3.76	3.67	60,735	7.72	7.61
Insulation	589	0.16	0.16	Included in roofing		
Waterproof & dampproof: foundation	} 672	0.18	0.18	Included in roofing		
exterior wall surface				Included in roofing		
Metal Lath, Furring & Plastering	9,832	2.71	2.64	58,487	7.43	7.33
Hollow metal work	.....	.....	.....	8,081	1.02	1.01
Miscellaneous Ornamental Metal	.....	.....	.....	22,753 h	2.89	2.85
Wall Covering, Interior						
ceramic	.....	.....	.....	16,811	2.14	2.11
metal	.....	.....	.....	Aluminum, included in roofing		
Floor covering: ceramic				Incl in ceramic above		
linoleum, cork, asph or rubber tile	2,800	0.77	0.75	11,135	1.41	1.40
terrazzo & marble				18,177	2.31	2.28
Painting: exterior	} 6,050	1.66	1.62	10,251	1.30	1.28
interior				Included above		
Finish Hardware	6,513	1.79	1.75	12,299	1.56	1.54
Acoustical Ceilings				13,100	1.67	1.64
Plumbing	123,490 a	33.11		200,455	25.49	25.12
Heating, Ventilating & Air Conditioning	Included in Plumbing			Included in plumbing		
Electrical Work & Lighting Fixtures	49,095	13.51	13.15	100,117 j	12.73	12.55
Elevators & Dumbwaiters				14,397	1.83	1.80
Casework	8,495	2.34	2.28	.....	.....	.....
X-ray Equipment	2,355	0.65	0.63	.....	.....	.....
Kitchen Equipment	10,740	2.96	2.88	.....	.....	.....
Miscellaneous	3,000 e	0.83	0.81	.....	.....	.....
Special Built-in Hospital Equipment				34,445	4.37	4.32
Power PLant	Included in Plumbing			Not in this Contract		
Total	$363,329	100.0%		$786,560	100.0%	.....
Curb & gutter and asph pave alternate	9,616		2.58	.....	.....	.....
Bonds, permits & temporary plant	.....	.....	.....	11,370	.....	1.42
Total Cost (excl sales tax)	$372,945	.....	100.0%	$797,930	.....	100.0%

a Incl heat, ventil & power plant
b Incl structural, misc & ornamental
c Metal doors & frames
d Roof deck $6,180; roofing, sheet metal & skylights $7,496
e Drapes & blinds $1,800; lockers $190; fire extinguishers & incinterator $1,010
f Incl floors & exterior walls
g Masonry
h Stainless steel
j Incl signals
k And alterations

What Jersey Communities Pay for New Schools

New Jersey school costs in 1958 ranged from $8.48 to $22.22 per sq ft 87¢ to $1.59 per cu ft and $311 to $2,533 per pupil.

These stayed within earlier extremes of highs and lows (ENR Mar. 20, 1958, p. 90) except for the small elementary school for 290 pupils that was built by a housing developer for the lows just reported. This school also was lowest in sq ft of space per pupil, 36.7, and in cu ft per pupil, 357.

High schools need more special purpose facilities thus cost more per pupil, but less per square or cubic foot.

In his second annual report, Cleve O. Westby, director, School Building Services, New Jersey Department of Education, has assembled the cost and space data tabulated here. They show what communities in that state are paying for their new schools.

This is how the maximums and minimums work out:

Type of School	No.	Sq ft space pupil Max	Med	Min
Elementary	14	103.6	57.0	36.7
Junior High	2	98.9		92.1
Senior High	6	150.0	129.7	100.6
		Cu ft space pupil		
Elementary	14	1,443	795	357
Junior High	2	1,396		1,356
Senior High	6	2,259	2,028	1,534
		$ per sq ft		
Elementary	14	$22.22	$16.94	$8.48
JuniorHigh	2	17.87		16.05
Senior High	6	19.86	16.13	13.08
		$ per cu ft		
Elementary	14	$1.59	$1.26	$0.87
Junior High	2	1.25		1.09
Senior High	6	1.20	1.04	0.96
		$ per pupil		
Elementary	14	$2,302	$983	$311
Junior High	2	1,767		1,478
Senior High	6	2,533	2,108	1,502

New Jersey Analyses School Space and Costs

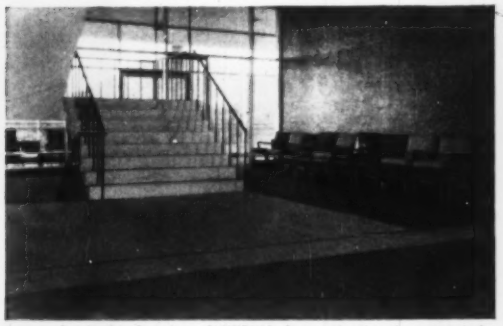
State Department of Education, Division of Business and Finance, Bureau of School Building Services

Grades	Capacity pupils	Space per pupil sf p	cf p	Unit Cost $ sf	$ cf	$ p	Contract date
K-8	380	57.0	763	17.02	1.27	970	2 58
K-6	290	73.4	1,023	17.22	1.24	1,264	3 58
1-6	700	64.8	934	17.41	1.21	1,128	2 58
K-6	1,140	103.6	1,443	22.22	1.59	2,302	6 58
K-4	290	56.9	850	19.47	1.30	1,108	5 58
K-6	430	55.2	657	12.95*	1.09*	714*	3 58
K-7	230	36.7	357	8.48	0.87	311	4 58
K-6	410	88.5	1,167	17.60	1.34	1,558	5 58
K-6	490	43.9	653	18.17	1.22	797	5 58
K-6	230	64.3	826	15.15	1.21	996	5 58
K-3	340	64.7	918	16.23	1.14	1,050	6 58
K-6	640	45.2	539	15.48	1.30	699	7 58
K-6	410	53.9	665	16.28	1.32	878	7 58
K-4	220	43.2	497	16.85	1.47	728	6 58
JHS	1,170	98.9	1,396	17.87	1.25	1,767	12 57
JHS	986	92.1	1,356	16.05	1.09	1,478	7 58
HS	580	137.8	2,094	15.26	1.00	2,104	2 58
9-12	1,360	100.0	1,684	16.22	0.96	1,622	3 58
10-12	1,086	127.5	2,110	19.86	1.20	2,533	4 58
HS	773	150.0	2,259	16.75	1.11	2,514	4 58
9-12	562	131.8	1,961	16.03	1.08	2,112	5 58
9-12	891	109.8	1,554	13.68	0.97	1,502	7 58

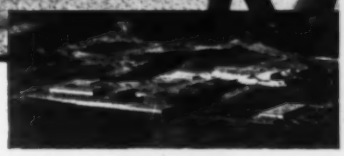
* Includes 4 classroom shells
† Built by Housing Developer

The AIR FORCE provides WALKING SAFETY at Colorado Springs

Library Building. Marble treads with TRU-TREAD abrasive inserts made by Vermont Marble Co., Proctor, Vt. and installed by Carthage Marble Co., Carthage, Missouri.



Academic Complex. ALUNDUM Aggregate treads precast by Marus Marble and Tile Company, Greensboro, N. C. ALUNDUM terrazzo landings and floors installed monolithic.



Cadet Quarters Complex. ALUNDUM Aggregate Treads precast by Integro, Inc., Trenton, N. J.

. . . with ALUNDUM AGGREGATE in Terrazzo Stairs and Floors

Air Force cadets need protection on the ground as well as in the air — especially on stairways. They're like all young people — always in a hurry, always dashing — so stairway safety is vitally important. It's been provided by the architects of the new and outstanding U. S. Air Force Academy by the use of Norton ALUNDUM Aggregate — literally tons of it.

The many stairways in the Cadet Quarters Complex and in the Academic Complex have been made permanently non-slip by ALUNDUM Aggregate in the precast terrazzo treads — also in the monolithic platforms and landings. Water tracked in on stormy days will not lessen the non-slip effectiveness of ALUNDUM terrazzo. The hardness and toughness of the Norton aggregate also greatly increases the ability of the terrazzo to withstand the constant traffic of many feet.

In the Library Building the marble treads of the beautiful spiral stairway have been made non-slip by twin strips at the nosing containing a Norton abrasive. These hard, tough strips also increase materially the durability of the treads.

*Skidmore, Owings & Merrill

NORTON
NON-SLIP FLOORS

NORTON COMPANY, WORCESTER 6, MASS.

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How to estimate ground-water discharge

of Beth-Cu-Loy subsurface drainage pipe

Use simple formula, or nomograph on opposite page

You can easily minimize ground water dangers by the proper use of subsurface drainage structures made from galvanized corrugated Beth-Cu-Loy sheets. Pipe for this purpose is perforated to permit excess ground water to trickle in and run off to a predetermined point of deposit. But—since the size of your subsurface pipe depends on the amount of ground water to be handled—how do you estimate the potential runoff?

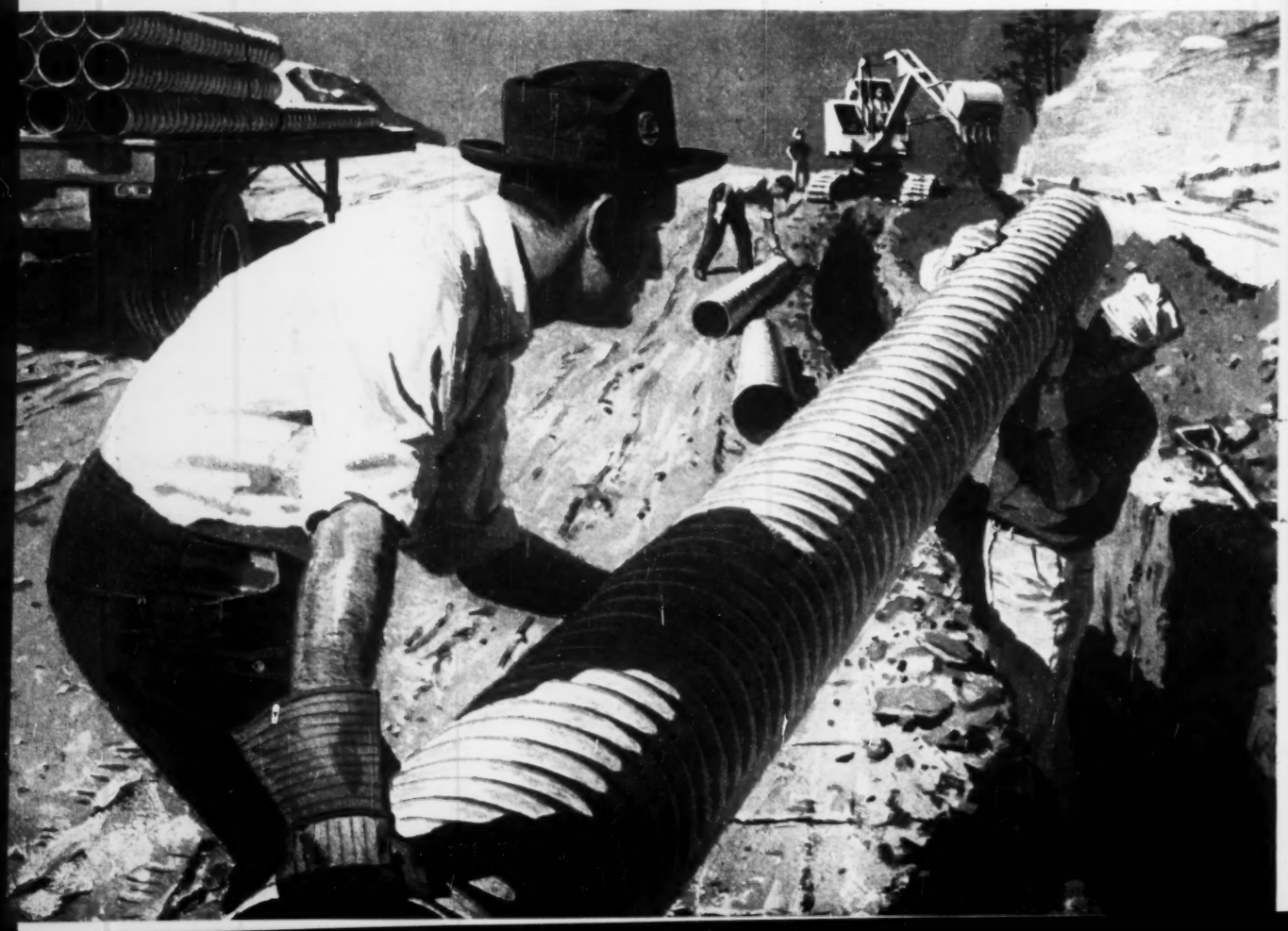
In plotting ground-water discharge under a variety of subsurface conditions, many engineers have been using the simple formula shown at the right.

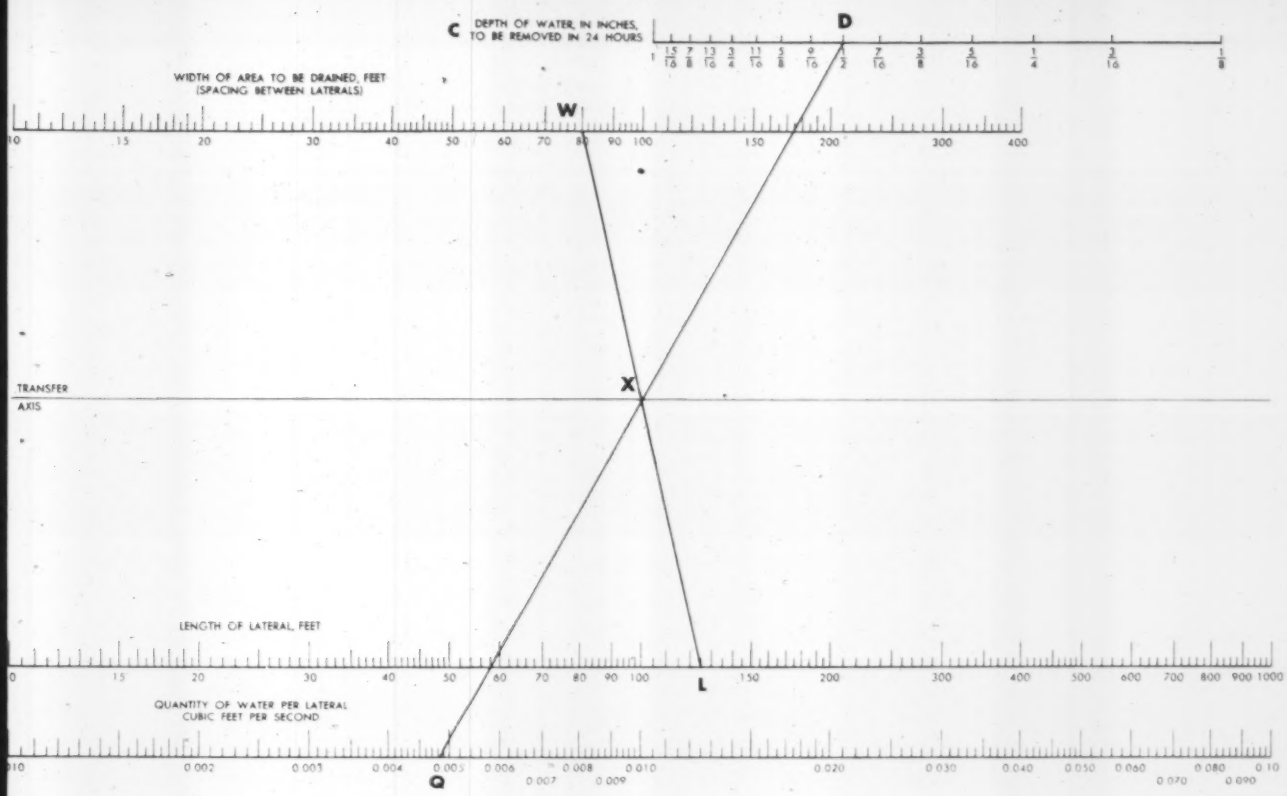
$$Q = \frac{C \times L \times W}{43{,}560}$$

where

- Q = quantity of water in cu ft per sec for each perforated pipe
- L = length of perforated pipe in feet
- W = width of area to be subdrained*
- C = a constant representing depth of ground water (in.) to be subdrained in 24 hrs (refer to table on opposite page for value of "C" to obtain cu ft per sec per acre. Your soils man can help in analyzing soil permeability and estimating the depth of water to be removed).

*One pipe only, not a network of drains.





How To Use This Nomograph

TABLE —CONSTANT C *(Subsurface Runoff in 24 Hours)*

Soil Permeability Type	Depth in.		Quantity of Water Per Lateral (cubic feet per second per acre)
	Fraction	Decimal	Constant C
Slow to Moderate	1/16	0.0625	0.0026
"	1/8	0.1250	0.0052
"	3/16	0.1875	0.0079
"	1/4	0.2500	0.0105
Moderate	5/16	0.3125	0.0131
"	3/8	0.3750	0.0157
"	7/16	0.4375	0.0184
"	1/2	0.5000	0.0210
"	9/16	0.5625	0.0236
Moderate to Fast	5/8	0.6250	0.0262
"	11/16	0.6875	0.0289
"	3/4	0.7500	0.0315
"	13/16	0.8125	0.0341
"	7/8	0.8750	0.0367
"	15/16	0.9375	0.0394
"	1	1.0000	0.0420

If you prefer to avoid arithmetical calculations, you'll find the nomograph a time-saver. Let's follow an example to see how the graph works out. Assuming an area-width (W) of 80 ft. and the length of the pipe lateral (L) to be 125 ft, draw a straight line (WL) between these points through the transfer axis line, thus establishing point X.

Let us further assume that your local soils technician has estimated that 1/2 in. of water is the depth to be drained in any 24-hr period. Draw another straight line from the "1/2" figure at point D, down through X, and extend it to the quantity line at Q. The reading at point Q shows that 0.0048 cu ft per sec of water can be expected through the lateral pipe.

Your Fabricator Can Help at This Point

With this information, your pipe fabricator can help you determine the size of pipe needed to handle the flow.

Pipe made from Beth-Cu-Loy galvanized corrugated steel sheets is ideal for subdrainage applications. It's strong, light in weight, long-lasting, and economical. Flexible, too. In all respects, it meets the rigid specs of the American Association of State Highway Officials.

Bethlehem makes only the Beth-Cu-Loy (copper bearing steel) sheets, not the pipe itself. Consult your fabricator for details on this versatile material.

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1st Quarterly Cost Roundup

Unit Prices

Water Supply Dam, Seattle

Features morning glory shaft type spillway tower, fish water release and seepage and and control works

Bidding into a 3-year work schedule for the $55.8-million Tolt River South Fork Storage Reservoir Dam for Seattle, the joint venture of Anderson Construction Co. and Wilder Construction Co. of Seattle shaded the engineers' estimate a fraction and came in 23% below the high bid.

This is an earthfill dam about 45 miles northeast of Seattle for the city's Board of Public Works. Carey & Kramer of Seattle are the consulting engineers.

The dam will be 970 ft long, 200 ft high, 1,600 ft wide at its widest point and will have a 20 ft roadway on its crest.

The upstream and downstream protective shell of the impervious core will be constructed of free draining material from the crest down to elevation 1,675 ft, and of random fill below that elevation. The upstream slope, from elevation 1,675 ft to the crest, will be protected by a 10-ft blanket of riprap against wave action and sloughing due to sudden drawndown.

The 180-ft-high, reinforced concrete morning glory shaft type spillway tower will be 570 ft long, with a 40 ft dia weir crest decreasing to an 18-ft-dia shaft. This spills into an 18 ft dia elbow at the base of the tower, which will be connected to the 18-ft horseshoe conduit, a 480 ft channel, 24 ft wide, a 250 ft flaring chute, a 114 x 60 ft stilling basin and a 135 ft, rip-rap lined discharge channel.

Spillway crest elevation will be 1,757 ft. A 37-ft-dia fabricated steel ring gate will raise the water surface to elevation 1,765 ft, with a working platform and hydraulic hoist system above the crest for raising and lowering the ring gate. The entire spillway tower will be founded on rock.

In addition to the dam structure and spillway tower and discharge works, contract includes construction of diversion and outlet works, service works, fish water release and various seepage control works, and pressure relief systems, slope stabilization, access roads and bridge systems.

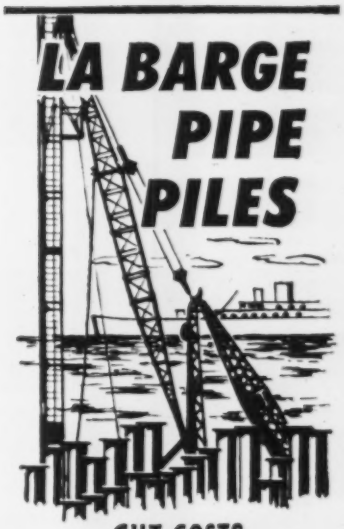
Prior to construction of a new road, access to the site is over logging roads. Nearest railroad is 18 miles from the project. Workers will be transported to the job daily by bus, no private cars being permitted to and from the construction site.

Washington law requires the employment of a minimum of 95% of bona fide state residents where more than 50 persons are employed on a project. Prevailing wages include: carpenters $3.13; bulldozer operators $3.26; compressors—excavating $2.99; steel erection $3.37; mucking machine operators $3.58; power shovel operators $3.63-$3.99; tractor operators $2.99; common laborers $2.70.

The bidding included:

1C Anderson Constr. Co. and Wilder Constr. Co., Seattle $5,759,156
2 Marwell Constr., Inc., Seattle & Mannix International, Inc 6,273,978
9 J. A. Jones Constr., Seattle 7,521,060
EE City of Seattle and Carey & Kramer, Seattle 5,777,983

Bids: 1-14-59 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$139,203	$221,500
Diversn & care river dur constr & unwaterg fndn	ls	job	137,701	239,285
Exc, common, in open cut, dam site & creek diversn	cy	578,000	0.792	0.76
right abut valley slope stabilization	cy	886,000	0.462	0.61
Exc, rock, various structs at dam site	cy	20,000	3.96	7.66
Drill line holes for rock exc at dam site	lf	31,300	1.98	1.32
Excavation, all classes, in river bed for core fndn, incl rock exc	cy	3,700	5.93	10.93
in shafts, fndn faults & seams	cy	500	10.20	37.00
stripping borrow areas	cy	76,000	0.396	0.54
Strip, remov & dispose all unsuitable matl from dam embankment areas	cy	104,000	0.61	0.89
Exc & transp to dam embankment & upstream blanket, com, borrow area C, over amt needed for structs	cy	16,000	0.46	0.53
borrow area Z	cy	25,000	0.66	0.63
sel sand & grav, area Z	cy	764,000	0.50	0.58
com, borrow area B	cy	25,000	0.66	0.58
Exc, rock, in bor areas D & D supplement, transp to dam embank	cy	75,600	2.30	3.27
for spalls, separate & tranp to dam embank	cy	10,000	3.63	6.08
Compact sel sand fill & sand & grav bkfl, various structs outsde dam embank	cy	27,700	1.74	6.42
Compact fill in embankments, dam & creek diversion, Zone 1, impervious	cy	304,000	0.265	0.25
dam, Zone 2, sel sand & gr	cy	729,000	0.265	0.12
Zone 3, random fill	cy	563,000	0.265	0.25
Rock fill in embank, Zo 4	cy	57,900	0.265	0.69
spalls, 8" max, in dam embankment, Zone 5	cy	12,100	0.265	0.83
Riprap slope protect of embankment, Zone 6	cy	51,700	0.265	0.74
Filter matl, upstrm blanket & dam embankment, Zone 7	cy	5,000	6.60	7.43
Spec compact of fill in dam embank, adj & contiguous to structures, impervious, Zone 1	cy	3,900	1.90	5.53
sel san & grav, Zo 2	cy	7,000	1.90	5.53
Add rolling for compaction	hr	200	24.00	30.10
Semi-comp bkfl around intake & spillway tower, place & compact	cy	2,000	0.50	1.65
Upstream blanket, compact fill, imperv, Zo 1	cy	137,000	0.33	0.25
crse grav & cob protect	cy	1,700	1.30	7.75



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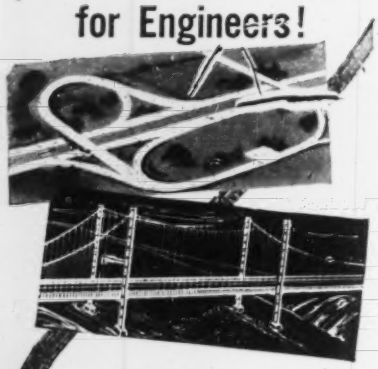

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. . . Seattle Water Supply Dam

Bids: 1-14-59 Items	Unit	Quantity	Unit Prices 1C	2
Dumped riprap outside dam embankment	cy	5,200	$0.65	$0.74
Drill fndn grout holes, in stage depth 0-35'	lf	450	4.55	5.78
35-70'	lf	700	4.35	5.45
Met pipe vlv & ftgs for fndn grouting f&p	lb	700	2.85	1.30
Hookup to grout holes	ea	35	132.00	11.84
Pressure grtg fndns	cf	7,600	5.25	6.24
w packers	cf	800	6.00	8.03
Core drill NX holes in stage depth 0-50'	lf	250	13.20	11.39
50-100'	lf	250	13.20	11.39
Drill horiz or incln drain holes in left abut rock, stage depth 0-30'	lf	450	12.00	10.40
30-60'	lf	450	12.00	10.40
60-100'	lf	400	12.00	10.40
Corrugated metal pipe f&i 10" perf with grav filter for left abutment drainage	lf	480	5.15	6.70
60", 8 ga, for pressure relief well syst tunn	lf	300	58.60	64.41
60", 10 ga, for pressure relief well syst tunn	lf	300	53.80	56.97
60", 8 ga, for right abut drainage tunnel	lf	275	58.60	61.93
60", 10 ga, for right abut drainage tunnel	lf	275	56.25	55.32
Tunnel end bulkheads f&i outlet structs, construct complete	ea	2	1,502	660.00
	ea	2	1,914	1,817
Drill holes in overburden for relief wells, in stages, depths 1-50'	lf	700	56.10	14.04
50-100'	lf	700	56.10	15.69
100-150'	lf	250	56.10	17.34
Slotted [illegible] wood stave pipe [illegible] bkfl, 6" f&i	lf	600	10.45	18.43
Outlet assems for [illegible] wells, complete f&i	ea	14	150.00	143.33
Piezometer installations, drill holes in overburden stages, depth 0-50'	lf	700	20.00	14.04
50-100'	lf	500	20.00	15.70
100-150'	lf	250	20.00	17.34
150-200'	lf	200	20.00	19.00
gages & cover assemblies	ea	14	250.00	210.56
assemblies & backfill	lf	2,250	6.80	5.20
Cor met perf pipe f&i abut drain syst, 15"	lf	750	13.20	12.78
left abut drain syst, 24"	lf	250	11.00	20.07
12"	lf	275	7.75	11.77
Split sewer pipe lined ditch, 18", constr compl	lf	2,700	6.60	5.78
Underdrain for 18" horseshoe conduit, 8" compl, f&i	lf	487	2.60	2.92
Conc sewer pipe drain, uncmted jts, 10", compl f&i	lf	1,380	3.00	4.26
Reinf conc sewer pipe, with uncmted jts, 15" f&i	lf	160	6.00	7.23
18" f&i	lf	100	8.25	10.90
with cmted jts, 10" f&i	lf	130	4.00	4.11
12" f&i	lf	100	4.40	4.90
15" f&i	lf	100	6.20	5.78
18" f&i	lf	100	10.00	7.43
Seed & fertilize embankment slopes	sf	540,000	0.037	0.08
Excavation, rdwy, common	cy	163,000	0.462	0.74
rock	cy	500	2.65	4.95
uncl structs	cy	500	3.65	5.88
Compact bkfl, rdwy structs	cy	8,300	0.90	3.57
Rdwy embankment, borrow	cy	500	1.65	1.00
Cr stn surf, rdwys f&p	cy	720	5.30	7.35
Ballast, rdwy base crse, f&p	cy	4,320	1.65	7.35
Water, rdwy surf compact	Mgal	1,500	4.00	3.30
CMP culv, rdwys, 36"⌀, 12 ga	lf	100	17.00	17.44
24"⌀, 14 ga	lf	100	9.25	10.00
18"⌀, 16 ga	lf	290	7.00	7.15
Conc culvert inlets	ea	7	440.00	182.00
Grd rail w conc posts, rdwy & park areas f&i	lf	2,500	5.00	4.44
Furn, cut, bend & pl resteel, 18" horseshoe conduit	lb	1,489,000	0.17	0.23
spillway tower	lb	171,000	0.20	0.23
intake tower	lb	200,000	0.20	0.23
remaining structs, incl serv conduit, spillway transi, open channel, chute, stilling basin, anchor blocks, diversn conduit & intake, crk diversn structs & misc structs	lb	836,000	0.185	0.23
Furn & place concrete, diversn & outlet intake structs	cy	92	94.00	71.70
diversn conduit invert & service conduit	cy	531	50.00	34.45
walls & roof of diversn conduit & serv conduit	cy	932	63.50	58.28
intake tower footing	cy	360	42.00	37.07
intake tower, from top footing to elev 1655	cy	654	79.20	57.55
1655-1775	cy	737	83.00	72.50
intake tower top slab	cy	18	136.00	102.00
spillw tower below elev 1645	cy	4,060	39.60	45.13
1645-1738	cy	953	70.00	68.53
1738-1757	cy	422	75.00	96.00
1757 to top	cy	46	272.00	128.00

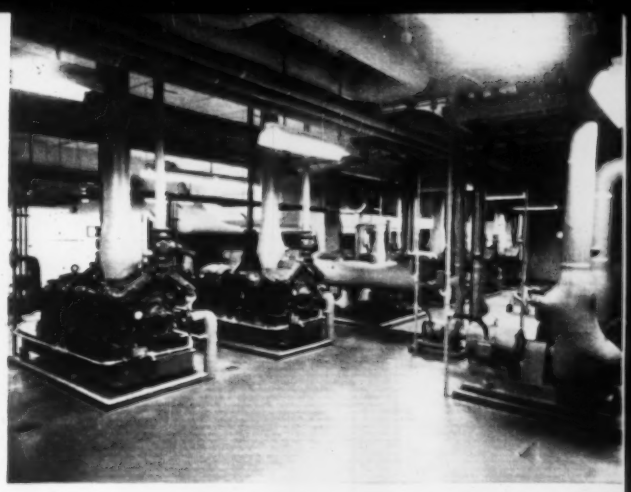
Bids: 1-14-59 Items	Unit	Quantity	Unit Prices 1C	2
horsesh conduit, invert	cy	1,211	$43.00	$40.74
side & crown	cy	3,179	75.00	70.07
chan transi	cy	157	107.00	61.85
open channel, invert	cy	530	56.50	41.80
walls	cy	425	133.00	87.50
invert of the chute	cy	387	69.50	41.38
chute walls	cy	103	173.00	105.86
stilling basin, seal	cy	840	49.50	34.46
bottom slab	cy	1,060	46.50	38.30
walls	cy	516	88.50	73.70
Furn all matl & const, compl crest control house	ls	job	4,856	4,425
lower control house	ls	job	12,465	11,304
fish water line pit	ls	job	1,616	1,671
Furn & place concrete fill under var conduits & structs	cy	200	35.00	35.52
anchor & thrust blocks	cy	185	49.00	41.31
service conduit	cy	1,530	58.00	47.39
foot bridge tower base	cy	15	139.00	94.77
misc structures	cy	200	79.00	71.90
blockouts for fixed wheel gate frames	cy	13	198.00	280.75
Anchor piles in stilling basin, const compl, drill in place	lf	1,400	13.00	21.22
Water stop, 3 bulb, type 1, 9" f&i	lf	410	4.80	4.95
2 bulb, type 2 f&i	lf	100	3.90	4.13
plastic, type 3 f&i	lf	77	2.65	3.30
Met seal strips for later plug construction f&i	lf	168	7.25	3.30
Met tubing & ftgs for grtg contraction joints f&i	lb	210	4.60	3.30
Gas joint sealer f&i	lf	605	0.90	1.90
Foot bri, compl fab&i	ls	job	13,629	11,710
stl tower fab&i	ls	job	7,656	5,450
stl gratings f&i	sf	1,180	5.80	9.10
Met gratings, misc met items & struct stl for intake tower, spillw tower, crest & lower contr hse pltfs, stairs, ladders, cyl supports, brackets, manholes, covers, anchor bolts & misc embedded items, complete f&i	lb	21,000	0.75	1.06
Misc iron & stl works for misc structures f&i	lb	6,700	0.77	0.91
Handrails & bar chains, f&i	lb	5,380	1.10	1.20
Wrought iron trash racks, frames & supports f&i	ls	job	66,898	59,450
Fixed wheel gate tracks & supports above gate seal frame f&i	ls	job	7,933	6,600
3 servic e intake fixed wheel gates, compl with stems f&i	ls	job	40,795	31,380
Outlet fixed wheel gate, compl with stem f&i	ls	job	34,940	31,790
Gate seal frames for serv & outlet gates f&i	ls	job	25,722	26,425
Ring gate, compl w guides, stems & seal for spillway tower f&i	ls	job	20,201	25,600
Mortar lined steel liner, 72" ID f&i	lf	810	88.50	98.00
Stl conduit, coal tar enamel lined, ctd & wrapped, or conc cyl pipe, 72" ID f&i	lf	653	111.00	116.00
Stl pipes, 54" ID or larger ftgs, incl bifurcation, couplings & heads, complete f&i	ls	job	28,119	33,050
Manhole, 24" in 72" service line f&i	ea	1	521.00	660.00
Fish water line, incl 18", 24", reducer, increaser, fittings & flanges f&i	ls	job	10,448	7,430
Met pipe & ftgs less than 6"⌀ f&i	lb	200	4.95	1.65
6"⌀ & larger f&i	lb	7,150	3.00	1.18
Stl sht piles, min 3/8", for crk diversn dam f&i	sf	1,200	7.00	8.25
Valve, compl w elec motor operator & accessories, 54" butterfly, service conduit f&i	ls	job	17,580	18,610
24" butterfly, fish water line f&i	ls	job	5,610	5,120
12" regulator, Howell, & Bunger tp, fish water line f&i	ls	job	14,463	15,390
Air relief vlvs, misc shutoff & bypass gates, 12" & smaller f&i	ls	job	1,309	1,410
Fish water flow metering system, compl f&i	ls	job	1,345	1,685
Reserv water level indicatg & recordg syst f&i	ls	job	846.00	1,060
Ice prevent syst, compl, incl cop tubings, galv stl pipes, ftgs & nozzles f&i	lb	700	6.60	1.40
Stroke hydraulic cylinders 3-8x102" for ring gate hoist, incl 3 counter bal vlvs & pipe f&i	ls	job	6,960	5,120
3-6x102" for upper service gates, compl with vlves & piping f&i	ls	job	4,681	3,965
1-12x156" for reservoir outlet gate, compl with vlvs & piping f&i	ls	job	8,139	7,430

(Continued on p. 122)

cold weather air heats new 9 story building

World's largest electric air source heat pump installation uses 12 Weinman pumps

NEW Columbus and Southern Ohio Electric Co. building, Columbus, Ohio has 9 stories above ground, one floor below ground level. It is designed for ultimate occupancy by 1,000 persons.



MAIN BATTERY. The main heat pump for the Columbus and Southern Ohio Electric Co. consists of 2 separate systems, each having three 100 hp. compressors (a total of 6). Right foreground: Weinman pumps in water distribution system are insulated to keep condensate off floor.

The world's largest electrically powered air source heat pump air-conditions this new building with 171,200 sq. ft. of floor space. The heat pump supplies 3.5 million BTU per hour for winter heating and 700 tons of refrigeration for summer cooling. This is the first application of a heat pump with a high-velocity induction system. The primary air system supplies high-velocity air to 537 underwindow water coil units around the building perimeter. These induction units are supplied 52° F. water the year 'round. Water temperature for the air-handling system serving the interior core of the structure is maintained at 42° F.

Weinman pumps used exclusively

12 Weinman pumps handle all liquids circulated in this big system. This includes hot and chilled water distributed to the air-handling system and hot water supplied to coils which reheat filtered air. In addition, heated oil is piped under the sidewalks to melt snow and ice.

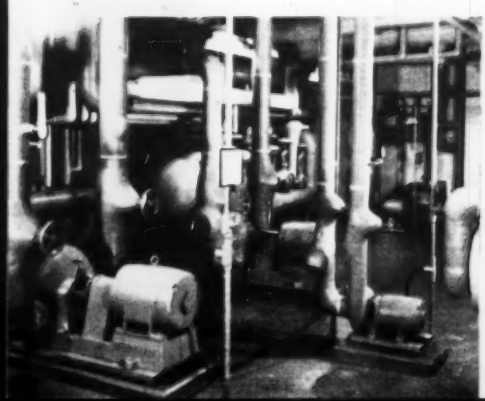
Only Weinman pumps are used in this big installation. No other make. There's a good reason. Weinman's complete line guarantees the right type, size and capacity pump for every need. And Weinman quality assures top efficiency, dependability and operating economy. Whatever your pumping problem, it will pay you to call your Weinman representative (he's in the Yellow Pages) or write us direct.

50th Anniversary 1909-1959

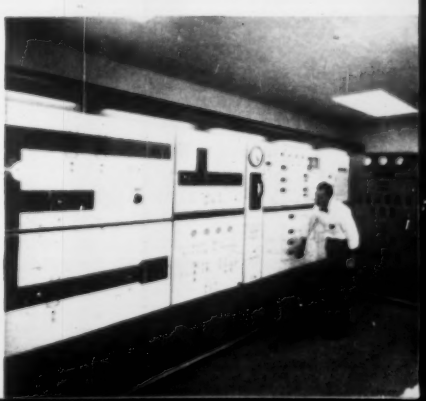
THE **WEINMAN PUMP** MFG. CO.

290 SPRUCE STREET COLUMBUS 8, OHIO

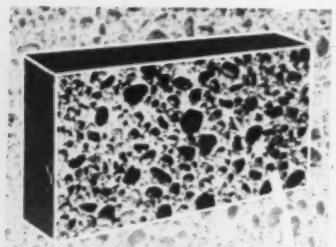
CENTRIFUGAL SPECIALISTS



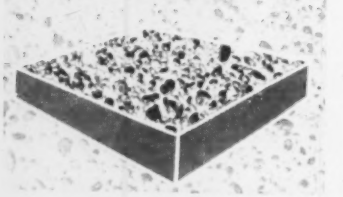
NEAT ARRANGEMENT. Weinman Type L-1 pumps, at left, move hot and chilled water through air-handling distribution system. Smaller Type K Unipump (right foreground) pumps cooling water only to IBM room. Because of heat produced by this equipment, room must be cooled all 12 months of the year. Note: Plaque which describes color code used in the power room.



NERVE CENTER. Supervisory data center monitors and controls the entire air-conditioning system. Here, engineer senses return water temperature at one of 75 test points.



A Simple Way to EXPOSE CONCRETE AGGREGATE ... Use RUGASOL



You will find that exposing concrete aggregate with Sika Rugasol is simple because it eliminates the need for costly chipping, hacking, or sandblasting. There are two types of Rugasol:

RUGASOL F . . . is painted directly on formwork. When forms are stripped (in 2 to 5 days), the retarded mortar is removed with a jet of water or stiff brush.

RUGASOL C . . . is applied on the surface of freshly placed concrete. On the following day, the retarded surface mortar is removed with a jet of water or stiff brush.

For complete information on Rugasol, call or write for Bulletin RG-58.

Ad 26-4

Sika SIKA CHEMICAL CORPORATION PASSAIC, NEW JERSEY

DISTRICT OFFICES: ATLANTA • BOSTON • CHICAGO DALLAS • DETROIT • NEW ORLEANS • PHILADELPHIA PITTSBURGH • SALT LAKE CITY — DEALERS IN ALL PRINCIPAL CITIES — AFFILIATES AROUND THE WORLD

. . . Seattle Water Supply Dam

Bids: 1-14-59 Items	Unit	Quantity	Unit Prices 1 C	2
Compl power & control unit, ring gate hoist f&i	ls	job	$3,557	$3,715
service & reservoir outlet gates f&i	ls	job	2,237	2,810
Ventilation syst, incl blower, duct & intake cover f&i	ls	job	562.00	4,310
Gaso eng driven generator set, 10KW f&i	ea	1	3,326	4,160
25K f&i	ea	1	5,089	6,275
Ltg fixts, standards, lamps, conv outlets, switches, conduits, wire & cable f&i	ls	job	13,200	16,515
Sound power telephone panels, compl f&i	ls	job	1,214	920.00
Circuit breaker panels, f&i	ls	job	$1,122	$850.00
Control panels, crest & lower crest house f&i	ls	job	898.00	680.00
Conc sewer pipe, 4" uncmtd jts f&i	lf	450	2.00	2.00
6" cmtd jts f&i	lf	100	3.00	3.47
*42" f&i	lf	150	24.50	44.00
Conc lined ditch, comp f&c	lf	400	10.40	12.40
Sales taxes	ls	job	82,788	83,593

f&c Furnish & construct. f&i Furnish & instal. fab&i Fabricate and instal. f&p Furnish & place. *Reinforced concrete.

Commence: 1-21-59. Completion schedule: 1,100 days.

Alert Facilities at Tucson

Crew Building at Davis-Monthan Air Base bid lump sum, alert apron and utilities, in unit prices

Work has begun on this three-part contract for alert facilities at the Davis-Monthan Air Force Base in Tucson, Ariz.

The award to M. M. Sundt Construction Co., Tucson, by the Corps of Engineers, Los Angeles, was 9.8% below the engineer's estimate and 21.5% below the high of four bids. It breaks down like this:

	Amount	% of Total
Operational Alert Apron	$1,028,400	64.5
Utilities	149,196	9.4
Readiness Crew Building	416,989	26.1
Total Contract	$1,594,585	100.0%

Concrete pavement for the operational alert apron, at $7.33 a cu yd for the 24 in. and $15 a cu yd for the 6 in., together with portland cement for the pavement at $3.50 a bbl., accounts for 40% of the total contract. Other work includes a crew readiness building, 14 reinforced concrete drainage structures, water lines, a sanitary sewer, storm drainage, paving, electrical work, miscellaneous structures, and related work.

Minimum wages include: tractor operator $3.24; crane & shovel operator $3.43; carpenter $3.32; concrete finisher $3.20; common laborer $2.36.

1C	M. M. Sundt Construction Co. Tucson, Ariz.	$1,594,585
2	Fredericksen & Kasler and Murray J. Shiff Co., a Jt. Venture, Sacramento, Cal.	1,826,585
4	The Ashton Co., Inc., Tucson, Ariz	2,032,594
EE	Corp. of Engineers, Los Angeles, Cal.	1,768,769

Bids: 1-13-59 Items	Unit	Quantity	Unit Prices 1 C	2
Operational Alert Apron				
Clear & grub	ac	59	$34.00	$50.00
Excavation	cy	31,700	1.16	0.90
Borrow	cy	56,900	0.86	0.75
P cmt conc pave, 16", remove	sy	745	1.50	5.00
Bituminous pave, 2" remove	sy	1,750	0.25	0.10
Stab aggregate base course	cy	8,550	4.36	5.00
Prime coat	t	87	56.00	50.00
Bituminous surface course	t	5,740	4.90	8.00
Asph cmt for bit surf crse	t	344	39.00	8.00
Port cmt conc pavement, 24"	cy	44,570	7.33	11.00
6"	cy	3,880	15.00	15.00
Port cmt for conc pavement	bbl	72,700	3.50	3.50
Pipe culvert, 24"	lf	306	6.75	7.50
30"	lf	62	8.50	10.00
Inlet & outlet structures for single pipe culverts	ea	14	65.00	90.00
Storm drain pipe, cl 3 RCP or 16 ga CMP, 18"	lf	70	6.23	7.00
4 RCP or 16 ga CMP, 18"	lf	1,265	6.65	7.00
3 RCP or 16 ga CMP, 21"	lf	60	7.00	7.50
4 RCP or 14 ga CMP, 30"	lf	360	11.85	11.50
3 RCP or 12 ga CMP, 39"	lf	94	15.25	16.00
42"	lf	302	17.65	18.50
48"	lf	460	21.25	22.00
Storm drain pipe, 4 RCP or 10 ga CMP, 57"	lf	658	$33.70	$33.00
3 RCP or 10 ga CMP, 60"	lf	1,200	32.00	36.00
4 RCP or 10 ga CMP, 60"	lf	290	44.60	50.00
RCP drain struct #1, headw	ls	job	1,500	1,500
#2	ls	job	1,237	1,450
#3	ls	job	1,104	1,500
#4	ls	job	1,235	1,550
#5	ls	job	1,307	1,500
#6	ls	job	610.00	700.00
#7	ls	job	612.00	650.00
#8	ls	job	612.00	650.00
#9	ls	job	560.00	600.00
#10	ls	job	1,013	1,200
#11	ls	job	1,291	1,600
#12	ls	job	685.00	900.00
#13	ls	job	550.00	550.00
#14	ls	job	470.00	500.00
Mod exist inlet struct	ls	job	160.00	150.00
Taxiway lighting	ls	job	7,980	8,000
Gas pipe, 1¼"	lf	490	1.68	1.10
3"	lf	1,150	2.70	2.20
6"	lf	1,405	5.10	2.75
Plug vlv & box, 1¼" lube	ea	1	47.00	50.00
3" lube	ea	1	67.00	100.00
Conn to 3" gas main, 1¼"	ea	1	59.00	50.00
3"	ea	1	135.00	50.00
6" gas main, 6"	ea	1	144.00	50.00
6"	ea	2	225.00	60.00
Paintg & strlpg airfield	ls	job	1,970	1,700
Tie down anchors	ea	384	7.50	7.00
Seeding	ac	32	200.00	270.00
Lower existing gas line	ls	job	724.00	500.00
Duct bank, reinf conc encased, 8 - 4"	lf	470	12.90	10.00
4 - 4"	lf	2,030	8.10	6.00
dir burial, 2 - 3"	lf	255	2.65	2.00
1 - 3"	lf	5,100	1.00	1.50
Taxiw ltg, conc handhole	ea	23	686.00	650.00
conc base w handhole	ea	86	230.00	175.00
Gas line remov	ls	job	1,835	1,500
Utilities				
Excavation	cy	12,280	1.16	1.00
Borrow	cy	1,000	0.86	1.00
Stab aggregate base crse	cy	635	5.50	6.00
Prime coat	t	8	56.00	60.00
Bituminous surface crse	t	400	5.60	9.00
Asph cmt, bit surf crse	t	26	39.00	9.00
Gravel surface	cy	692	4.95	6.00
Conc comb curb & gutter	lf	2,800	2.70	3.00
curb & gutter remove	lf	118	0.60	1.00
curtain walls	lf	380	5.00	4.50
Pipe culvert, 33"	lf	240	8.50	11.00
36"	lf	48	11.00	13.00
Inlet & outlet structs, single pipe culverts	ea	4	257.00	300.00
Reinf conc headwalls	ea	2	300.00	400.00
Parking area striping	ls	job	125.00	50.00
Chain link fencing	ls	job	10,420	12,000
gate, 30"	ea	1	470.00	400.00
Barb wire fence, existing remove & salvage	lf	2,000	0.11	0.25
remove & relocate	lf	2,030	0.34	0.35
Gate, remov & reloc exist	ls	job	45.00	200.00
Railroad intersection	ls	job	745.00	1,000
Sanitary sewers	ls	job	8,580	10,000
Water lines	ls	job	61,840	55,000
Elec distri & security ltg	ls	job	23,885	27,000
Gate house	ls	job	2,700	1,600
Readiness Crew				
Building	ls	job	406,000	475,000
Borrow	cy	8,900	0.86	1.00
Stab aggregate base crse	cy	180	5.50	7.00
Prime coat	t	2	56.00	100.00
Bituminous surface crse	t	100	5.60	10.00
Asph cmt, bit surf crse	t	7	39.00	10.00
Seeding	ac	0.7	2,000	400.00

Commence: 1-20-59. Completion schedule: 270 cal days.

(Unit Prices continued p. 126)

THERE MUST BE AN EASIER WAY

SAME OLD GUESSING GAME EVERY DAY— "DRAWING, DRAWING, WHO'S GOT THE DRAWING?"
ANY OF YOU GUYS SEEN THAT HOOTAN HOLLER DRAWING A-6105?
HE SAYS I FILED IT WRONG
I'LL LOOK IN THE WASTEBASKETS AGAIN
DIDN'T WE THROW THAT OUT THE WINDOW WHEN THE PARADE WENT BY?
I THINK SOMEONE TOOK IT OUT TO THE COAST OR SOMETHING
WE WON'T HAVE ANY DRAWINGS LEFT IF WE DON'T CALL IN A BLUEPRINTER AND ORDER AUTOPOSITIVE PAPER INTERMEDIATES.

Much easier for you when you have your local blueprinter—or your printroom—make intermediates of your drawings on Kodagraph Autopositive Paper.

That simple act lets you file away your valuable originals safely in the vault. And there they can rest until you need more Autopositive Paper Intermediates to replace any you may lose.

Your Autopositive Paper Intermediates—with dense black photographic lines on clean, white, translucent background—take the place of originals in drafting and printmaking. They won't smudge or smear. Yet you can make drafting changes at will. And after doing so, you can make "Autopositives" from "Autopositives". . . get brand-new, ink-like "drawings."

Kodagraph
Reproduction Materials

The cost of these intermediates is trifling compared to the savings in drawing protection and drafting short cuts—not to mention the higher print quality obtained.

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Gentlemen: Send me a free copy of your booklet on Kodagraph Reproduction Materials. 67

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Kodak
TRADE MARK

James and Harriss, a.i.a. design a

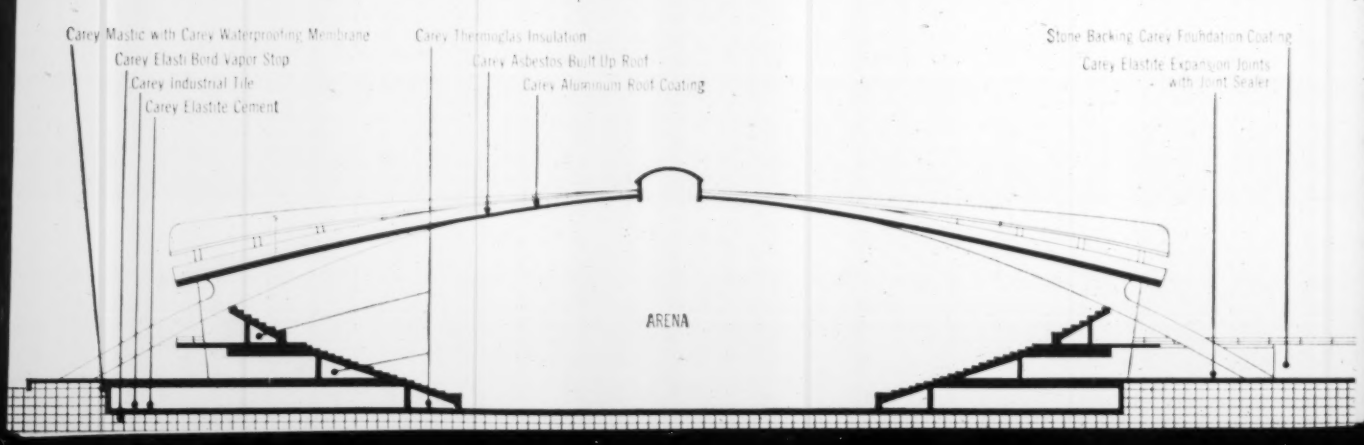
sports and civic center

The growth of public interest in urban re-development, and of public willingness to accept the financial burdens involved, will be advanced by projects which have as their objective the greatest potential for public participation.

This SPORTS AND CIVIC CENTER is the kind of project which fulfills that objective by providing recreational and cultural opportunities for the entire community. Architects James & Harriss conceived this center as the focal project in a major urban re-development program.

The master renewal plan for the city of Atlanta, Georgia, provided the architects with a choice of sites. The center was planned on one of these as a design project, commissioned by The Philip Carey Mfg. Company.

In the execution of their commission Messrs. James & Harriss utilized a number of Carey Building Products. Plan and detail sheets are available to architects and builders who may be interested in their design and application technique. Ask your Carey representative or write The Philip Carey Mfg. Company, Lockland, Cincinnati 15, Ohio. Dept. ENR-39.


Carey Mastic with Carey Waterproofing Membrane
Carey Elasti-Bord Vapor Stop
Carey Industrial Tile
Carey Elastite Cement
Carey Thermoglas Insulation
Carey Asbestos Built-Up Roof
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CAREY 4.2 CORRUGATED
ROLLER RINK
PLAZA CANOPY
CAREYLASTIC JOINT SEALER
CAREY ELASTITE EXPANSION JOINT
CAREYSPUN MINERAL WOOL
CAREY MASTIC
PERIMETER INSULATION
PLASTER ON CAREY SEMI MASTIC PLASTER BOND
CAREY ELASTI BORD VAPOR STOP
BOWLING ALLEY
CAREY ELASTITE EXPANSION JOINT
CAREY ELASTI BORD VAPOR STOP
WALL SECTION ROLLER RINK & BOWLING ALLEY

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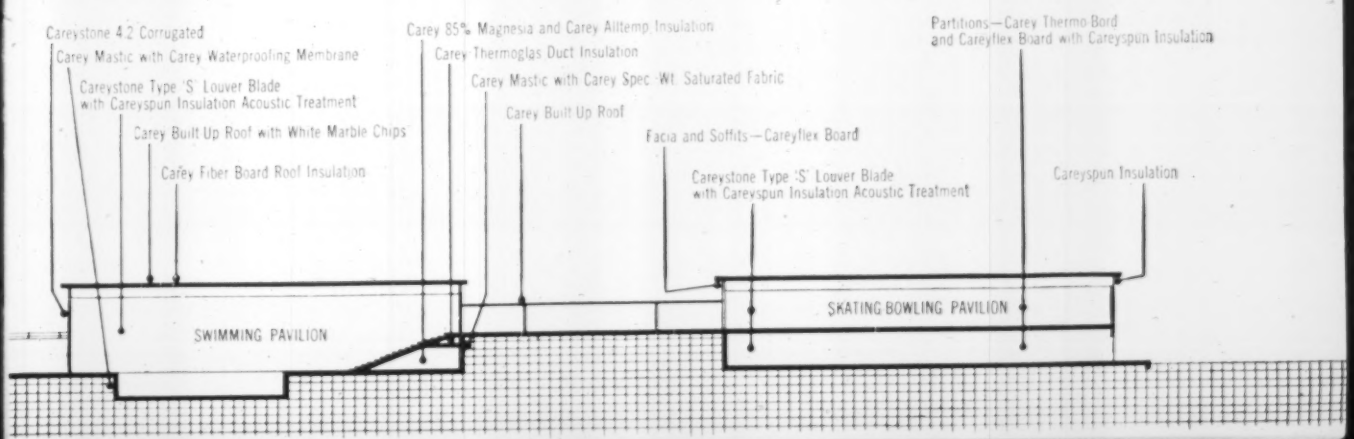
BETTER PRODUCTS FOR BUILDING SINCE 1873


Careystone 4.2 Corrugated
Carey Mastic with Carey Waterproofing Membrane
Careystone Type 'S' Louver Blade with Careyspun Insulation Acoustic Treatment
Carey Built Up Roof with White Marble Chips
Carey Fiber Board Roof Insulation
Carey 85% Magnesia and Carey Alltemp Insulation
Carey Thermoglas Duct Insulation
Carey Mastic with Carey Spec. Wt. Saturated Fabric
Carey Built Up Roof
Facia and Soffits—Careyflex Board
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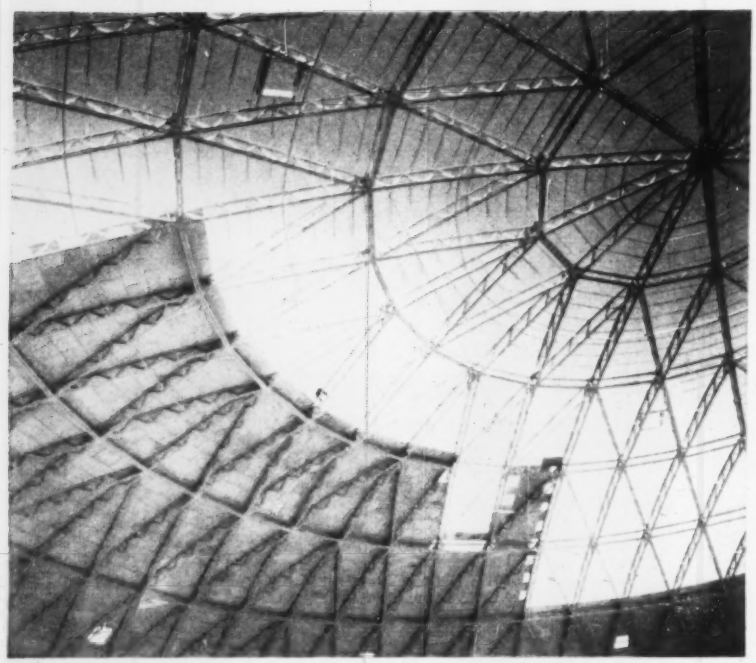
Partitions—Carey Thermo Bord and Careyflex Board with Careyspun Insulation
Careyspun Insulation
SWIMMING PAVILION
SKATING BOWLING PAVILION



Lightweight Tectum complements lightweight Lamella framing in San Angelo Municipal Coliseum, San Angelo, Texas. Acoustics are ideal. Architects and Engineers: Mauldin-Ballard & Associates, A.I.A. Tectum Erector: United Materials Co.

Tectum Roof Deck Speeds Erection on San Angelo, Texas, Coliseum

Spanning 267 feet on a Lamella framing system, this beautiful Tectum roof provides a striking and effective acoustical dome. Here are the interesting facts for designers and contractors: Tectum goes down dry; erection time is sharply reduced; its relative lightness *leads to reduction of weight and cost of structural system.* Tectum is factory-finished, *normally needs no painting;* Tectum is precut to specification — *saves cutting on the job.* (Only the uppermost area, where framing converges, required cutting.) Large areas are covered quickly, economically.

These values add up to important savings. Tectum insulates, is structural, fire-safe and acoustical. It's a quality board that looks the part. Standard lengths and widths as well as custom lengths to order. Thicknesses from 1" to 3". Tectum meets seismic requirements as a roof diaphragm.

For complete information, write Tectum Corporation, Newark, Ohio. Plants in Newark and Arkadelphia, Arkansas. Regional offices in Philadelphia, Atlanta, Columbus, Chicago, Dallas, Beverly Hills, Seattle and Toronto, Canada. Capable distributors in all leading areas.

Tectum®

QUALITY • INTEGRITY • SERVICE 8-22

Texas Air Base Contract is 22% Below Estimate

This $122,608-contract to Cage Bros., San Antonio, Tex., is for overlay of a 5,000 ft runway at the Brooks Air Force Base in San Antonio. The award by the Base Procurement Office is 22% under the engineer's estimate. Capt. James Anderson, U. S. Air Force, is contracting officer.

Bituminous binder course, $13,300 tons at $5 a ton, accounts for over half the contract. Other prices on this item ranged from $5.50 to $6.41 a ton.

1C Cage Bros., San Antonio	$122,608
2 H. B. Zachry Co., San Antonio	130,741
4 D. L. Muffen & Co., Inc., San Antonio	146,361
EE Base Procurement Office, Brooks Air Force Base, San Antonio	157,300

Bids: 1-7-59

Items	Unit	Quantity	Unit Prices 1C	2
Bituminous binder course	t	13,300	$5.00	$5.50
surface course	t	8,900	5.50	5.75
Tack course	gal	8,900	0.20	0.18
5 runway lights, raise	ls	job	875.00	1,564
marking, paint	ls	job	1,187	1,210
Weed killer, apply	ls	job	647.00	2,100

Completion schedule: 120 calendar days

Borrow is Problem on Idaho State Highway

Running through scabby lava land, this road job from Wendell to Gooding, Idaho, will require 500,000 cu yd of borrow to hold up the grade line and construct the earth embankment.

Contract prices on this item at 28¢ a cu yd, together with 257,000 yd units of haul at 25¢ a unit, accounts for 19.3% of the $1,057,708 contract to Fife Construction Co., Brigham City, Utah. The Idaho Department of Highways made the award on a low bid less than 2% below the second bid; 20% below the high of seven bids. M. R. Brown, Shoshone, is the engineer.

Work includes grading, construction of roadway drainage structures, a plant-mix bituminous surface, and a 40 ft concrete bridge, for a total of 9.811 miles on State Highway 46, at an average cost of $107,808 a mile.

Class A concrete is AASHO, and must attain a minimum compressive strength of 3,000 psi in 28 days. Cast iron pipe is 150 lb and 300 lb.

Prevailing wages include: asphalt plant fireman $2.71; power crane operator $3.11; roller operators $2.50; unskilled laborers $2.35.

1C Fife Constr. Co., Brigham City, Utah	$1,057,708
2 Duffy Reed and M. K. Co., Twin Falls, Ida	1,078,838
7 Peter Kiewit, Idaho Falls, Ida	1,324,346

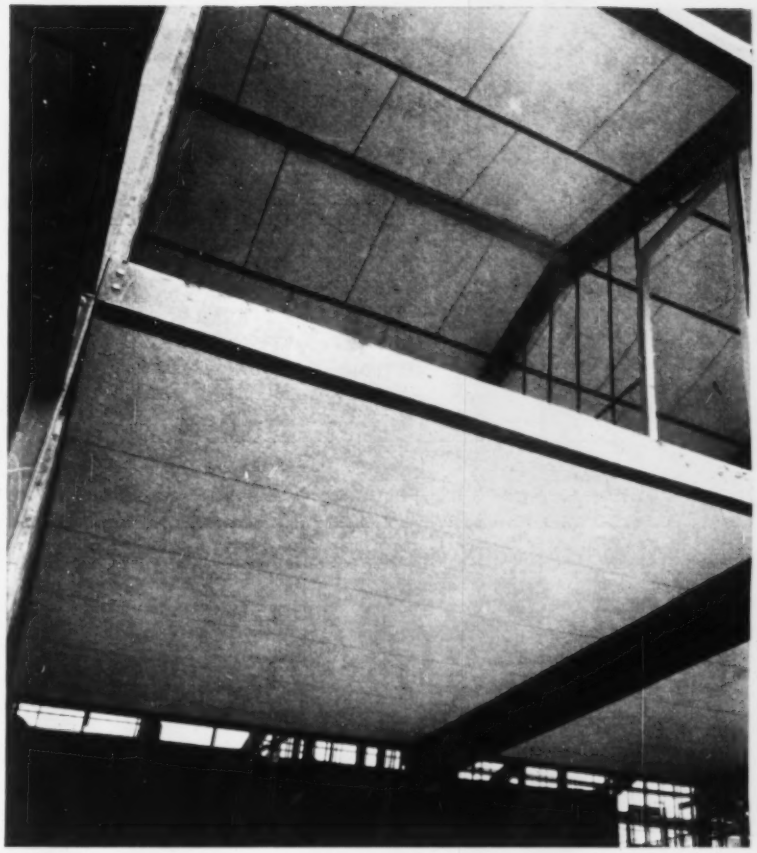
Bids: 12-30-59

Items		Unit	Quantity	Unit Prices 1C	2
Trees, select	remov	ea	185	$20.00	$25.00
Stumps, select	remov	ea	18	20.00	25.00
Bridge	remov	ea	1	5,000	2,500
Culvert	remov	ea	8	200.00	125.00
Siphon	remov	ea	6	250.00	125.00
Curb	remov	lf	750	0.50	0.75
Gutter	remov	lf	130	1.00	0.75
Curb & gutter	remov	lf	25	1.00	0.75
Concrete walk	remov	sy	210	0.50	0.75

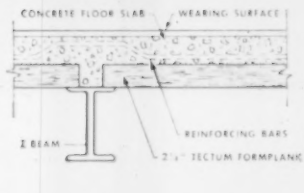
. . . Idaho State Highway

Bids: 12-30-58 Items	Unit	Quantity	Unit Prices 1 C	2
Catch basin, remov	ea	1	$50.00	$25.00
Conc headwalls, remov	ea	45	20.00	15.00
checks, remov	ea	6	50.00	15.00
Misc irr structs, remov	ea	20	40.00	15.00
Excavation, uncl	cy	125,000	1.56	1.55
channel cleang	cy	60	2.00	2.00
structural, Sch 1	cy	325	10.00	3.50
Sch 2	cy	3,825	3.00	3.25
Borrow	cy	500,000	0.28	0.28
Haul	yu	257,000	0.25	0.31
Foundation compaction	unit	250	20.00	28.00
Watering	Mgal	43,000	1.20	1.15
Rolling, power roller	hr	725	8.00	7.50
pneu tiretl roller	hr	725	8.00	7.50
Mech tamping	cy	2,585	2.00	2.00
Small ditches	lf	17,500	0.12	0.20
Old road, cl 1, oblit	sta	22	30.00	50.00
Strip material deposits	cy	101,000	0.20	0.10
Cr grav base crse, 2" max	t	82,700	0.95	1.28
type B, 3/4" max	t	66,500	1.10	1.30
Asph for prime coat, MC-2	gal	73,800	0.18	0.17
Blotter material, cl C	t	1,175	2.00	2.50
Bit surf treat, type C, MC-5 asph	gal	3,600	0.20	0.19
cover coat matl, cl 3	t	215	5.00	4.00
Plantmix, 120-150 pene asph road matl	t	1,760	40.00	40.00
bituminous surface, cl C	t	21,700	3.10	3.25
cl E	t	13,550	3.35	3.25
for approach roads	t	1,590	5.00	4.00
Conc, cl A precast stringers	cy	35	90.00	77.00
poured in place	cy	320	80.00	88.00
cl C	cy	20	80.00	55.00
Metal reinforcement	lb	46,050	0.15	0.165
Stl bm handrail, conc struct	lf	125	5.00	7.70
Untr timb, F-1450 stress gr	Mfbm	0.40	500.00	330.00
Pipe culv, tp B, 22"x13"	lf	155	4.00	4.30
tp A or F, cl 3, 12"	lf	1,000	2.90	2.90
cl 4, 18"	lf	95	3.75	4.35
tp B or F, cl 4 18"	lf	175	4.00	4.50
24"	lf	750	6.00	5.90
tp A or F 50"x31"	lf	275	15.00	15.50
Cor met pipe siphon, 12"	lf	1,200	4.00	3.90
15"	lf	20	5.00	4.50
18"	lf	1,950	6.00	5.50
24"	lf	130	7.50	9.25
30"	lf	130	8.00	11.35
24" irr	lf	520	6.00	6.90
36" irr	lf	125	12.75	13.00
Irr g pipe, 6"	lf	140	2.00	1.70
12"	lf	780	3.10	2.90
18"	lf	150	3.75	4.10
24"	lf	125	6.20	6.85
CMP, cl 2, bit ctd, 12"	lf	20	3.50	4.00
Catch basin, type 2	ea	7	250.00	132.00
Loose riprap	cy	60	5.00	7.50
Conc gutter	lf	730	4.00	1.65
comb curb & gutter	lf	5,000	3.25	2.15
Steel beam type guard rail	lf	925	4.00	3.25
Guide posts, type 4	ea	285	7.00	6.05
Wire fence, type 1 B	lf	2,950	0.32	0.32
3 B	lf	21,400	0.40	0.39
Steel gates, type 2, 10'	ea	65	42.50	60.00
14'	ea	6	50.00	75.00
Conc sidewalk	sy	40	3.50	5.50
Backfill, special cl A	cy	45	4.00	5.50
Right of way markers	ea	50	10.00	10.50
Selected topsoil	cy	1,000	5.00	0.50
Drain wells, adjust	ea	2	300.00	1.35
Metal slide gate, 10"	ea	1	45.50	55.00
12"	ea	6	50.00	50.00
15"	ea	1	50.00	65.00
18"	ea	2	72.00	80.00
Spiral welded stl pipe siphon 12"	lf	130	5.00	4.10
14"	lf	930	6.10	4.75
16"	lf	95	7.00	5.35
18"	lf	470	7.40	6.25
Trash rack, 12"	ea	1	30.00	25.00
18"	ea	3	40.00	30.00
30"	ea	1	50.00	50.00
22"x13"	ea	1	22.00	30.00
Well, drilling 6"	lf	105	10.00	10.00
casing, 6"	lf	25	7.00	5.00
Drain well screen	ea	1	100.00	205.00
Conc driveways, remov	sy	50	1.00	1.00
cl A	sy	800	3.50	5.00
slab, remov	sy	10	2.00	1.00
Steel pipe, 8"	lf	35	4.50	2.70
Metal weir, 24"	ea	3	40.00	45.00
Slide gate, galv sht met, 6"	ea	2	5.00	15.00
12"	ea	4	8.00	17.50
Valve, 4" riser	ea	4	6.15	5.00
1" air	ea	2	80.00	85.00
4" drain	ea	3	60.00	65.00
4" gate	ea	2	65.00	65.00
12" gate	ea	2	300.00	275.00
Dresser coupling, 14"	ea	2	35.00	35.00
18"	ea	1	40.00	45.00
Pipe reducer, 18" to 14"	ea	1	65.00	65.00
Metal headgate, salvage	ea	8	10.00	16.50
Weir crest, salvage	ea	1	25.00	15.00
Steel elbow, 8"90	ea	2	30.00	30.00
Precast conc headgate, 12"	ea	25	15.00	20.00
18"	ea	1	42.00	35.00
Clear dump areas	ea	2	1,500	500.00
Flasher instal, salvage	ls	job	100.00	250.00
Flashing beacon, instal	ls	job	1,900	2,500
Seeding	ac	450	50.00	20.00
Detours	ls	job	2,500	4,000
Galv iron pipe, 1"	lf	35	2.00	2.00

Completion schedule: 250 working days
Liquidated damages: $200 day



Two uses for versatile Tectum are shown in the new Reed College Men's Dormitory. The roof deck is Tectum tile. The ceiling material of the first floor is the new Tectum formplank. Architects: Shell, Hoyt and Farnham. Contractor: Juhr & Sons, Portland, Oregon.



Cross section of Tectum used as formplank for reinforced concrete slab. →

"In-Place" Tectum Formplank Doubles as Acoustical Ceiling

Tongue and groove Tectum formplank is 9' long and 2½" thick and is shored during the pouring of the concrete slab. After the concrete cures, the shoring is removed and the Tectum remains as a beautifully textured acoustical ceiling. Consider these advantages: Structural Tectum allows economical shoring; Tectum is available in any length needed, saves cutting; forms are handled only once; Tectum formplank eliminates grinding and finishing work on concrete ceilings; saves on acoustical ceiling material where specified; Tectum insulates, is noncombustible, may be painted if desired; beveled edges on the long dimension make neat, solid joints.

For complete information write Tectum Corporation, Newark, Ohio. Plants in Newark, Ohio and Arkadelphia, Arkansas. Branch offices in Philadelphia, Atlanta, Columbus, Chicago, Dallas, Beverly Hills, Seattle and Toronto, Canada. Distributors in all principal cities.

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Lambro River bridge along Italy's "Highway of the Sun" uses rubber cushions at girder supports.

Unusual Bridges Mark 'Highway of

EUROPE'S LONGEST PRESTRESSED BRIDGE carries the route over the Po River in its northern section.

Italy's 460-mile "Highway of the Sun," now 20% completed, has two unusual bridges in its northern section. When finished, the route will extend from Milan to Naples and run through Bologna, Florence, Rome and other historic cities.

Europe's longest prestressed concrete bridge is being built along the highway at a crossing of the Po River, near Piacenza. Measuring 3,858 ft from abutment to abutment, the bridge will have 14 spans of 246 ft and end spans 207 ft long.

In the same sector is a bridge over the Lambro River that has precast concrete girders supported on precast concrete piles, with hinge effect cushioned by rubber pads. At other points of this bridge rubber cushions have been interposed between brackets and girder terminals. The rubber pads introduce flexibility and reduce abrasion.

The 63-mile Milan-Parma section in the north and the 25-mile stretch between Capua and Naples, in the south, are finished except for completion of bridges over the Po and Volturno rivers.

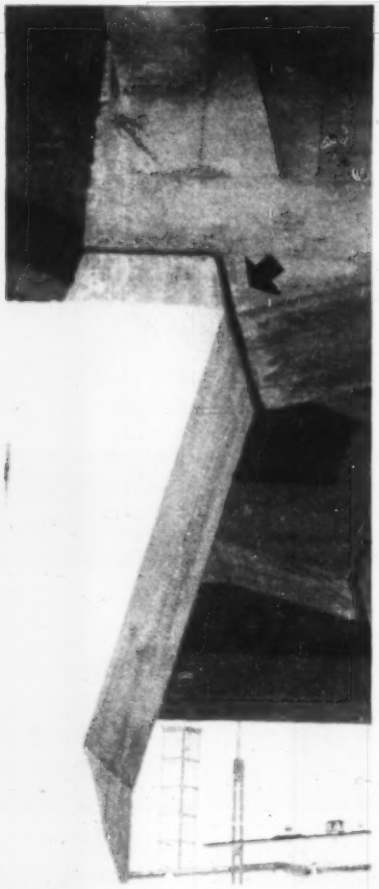
The $300-million, 460-mile turnpike (ENR Dec. 12, 1957, p. 76) is scheduled to be finished in 1963. The northern section will be extended to Florence by the end of this year and the Capua-Rome stretch is expected to be finished early in 1960.

Designed for speeds up to 100 mph, the highway is a four-lane route with a 10-ft center island and 10-ft lanes on each side for motorcycles and scooters.

(*International continued p. 130*)

It's prestressed concrete.

the Sun'



RUBBER PLATES (arrow) at bridge joints reduce abrasion.

A road marker consisting of a statue of a demon in Bali, Indonesia.

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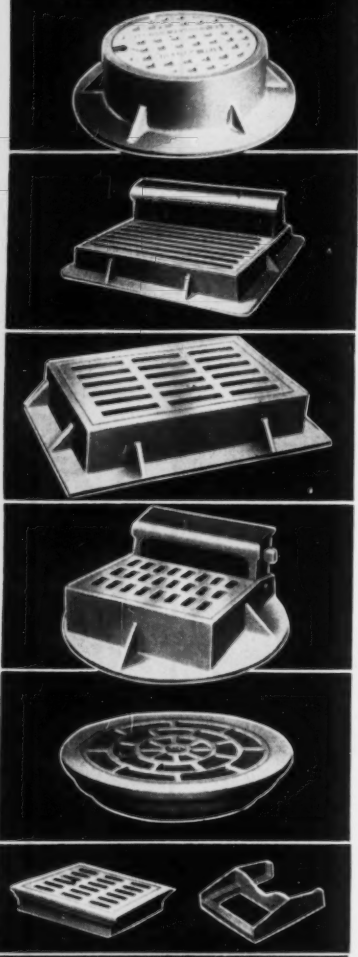

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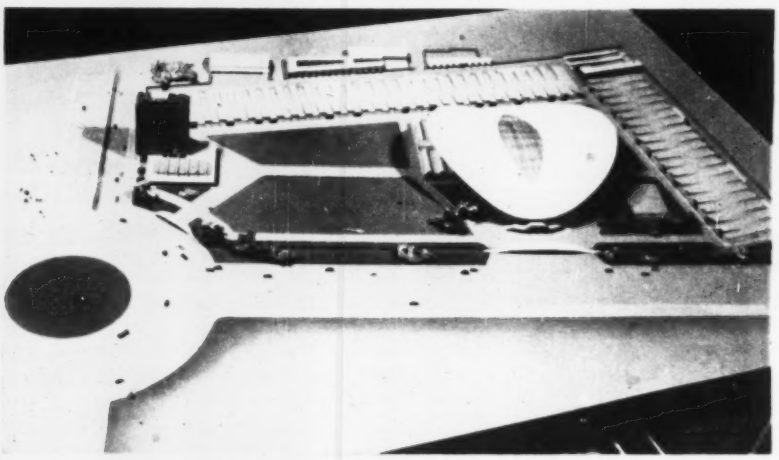
Japanese Finish Long Bore

Japan has completed a 9,745-ft-long tunnel that cuts 19 miles and one hour off the travel time between Tokyo and Kofu, capital of Yamanashi prefecture, 90 miles to the northwest.

The tunnel—Sasago—is 3,630 ft above sea level—believed to be the world's highest tunnel. It cuts through the Sasago mountain range.

The $3.6 million bore is 25 ft wide. Fluorescent lights spaced 46 ft apart are used for lighting.

Construction of the tunnel was handled by the Road Construction Corp.



Cow Palace for Buenos Aires

The Argentine Rural Society will spend $8 million this year to build modern exposition grounds on a 27-acre site in Buenos Aires.

The Society's 8,000 members own the country's estimated 45 million cattle and 45 million sheep.

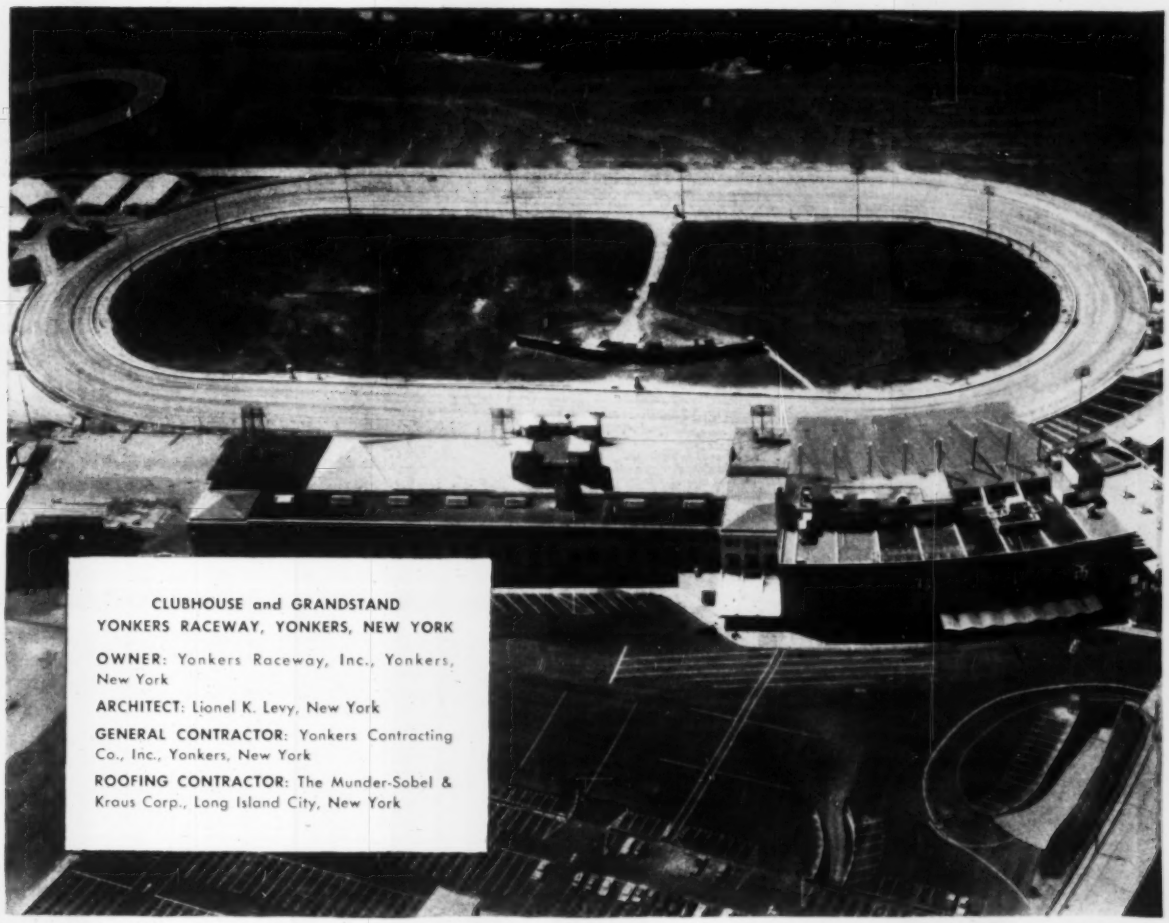
The building project is divided into three parts:

- A 30,000-seat stadium featuring a cable-suspended roof.
- Exposition halls enclosing 322,000 sq ft. Roofing will be suspended by a cable structure, similar to the stadium.
- Administration building 17 stories high. It will house offices of the Society and other associated groups.

Construction of the project will start as soon as the annual exposition ends, and is expected to be complete before the end of the year.

(International continued p. 132)

RUBEROID BUILT-UP ROOFING PROTECTS FANS AT AMERICA'S DREAM TRACK!



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OWNER: Yonkers Raceway, Inc., Yonkers, New York

ARCHITECT: Lionel K. Levy, New York

GENERAL CONTRACTOR: Yonkers Contracting Co., Inc., Yonkers, New York

ROOFING CONTRACTOR: The Munder-Sobel & Kraus Corp., Long Island City, New York

They're off! Yonker's ultra-modern trotting track has quickly won acclaim from architects and fans alike. Its smooth, functional lines represent the latest design, offering a perfect view of track events from every part of the grandstand. Even more important, from the structural viewpoint, it offers all-weather protection throughout the summer and fall racing seasons.

Ruberoid Built-Up Roofing on Club House and Grandstand Extension contribute a significant share to the weather protective features of both structures. 668 squares of Special Roofing Bitumen Spec. 203-A over Insulation Board, and Special Roofing Bitumen Spec. 202-A over nailable concrete contribute, economically, to this dream track's full-time protection.

Whatever you design or build, you'll find Ruberoid Built-Up Roofing *engineered* to the job!—and to your needs! To insure client satisfaction with maximum economy, we suggest that you get details of Ruberoid Built-Up Roofing Specifications, by writing: The RUBEROID Co., 500 Fifth Avenue, New York 36, N. Y.

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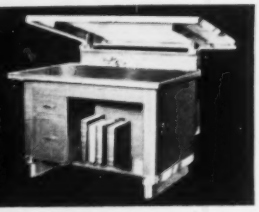

the drafting table-desk combination with **all** the features

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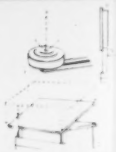
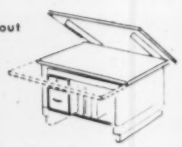


Reference desk has linoleum covered pull-out top for "sit-under" comfort . . . full width plan drawer, tool drawer with tray and lock, deep file drawer . . . generous bookshelf.



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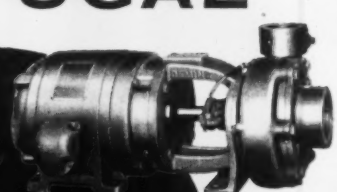

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. . . *International*

Red China Is Rebuilding Historic Grand Canal

As part of its second five-year plan, Communist China is rebuilding the 2,400-year-old Grand Canal, which runs from Peiping to Hangchow—1,056 miles, or about the distance between New York City and Miami Beach.

Work began last summer on widening and deepening the historic waterway. The rehabilitation of the canal, scheduled for 1962, will link five important rivers—Huai, Yangtse, Yellow, Chientang and Hai—and form a water transport system that will cover more than half of the Chinese mainland.

In China, where most of the rivers run from west to east, the north-south Grand Canal has political and economic significance.

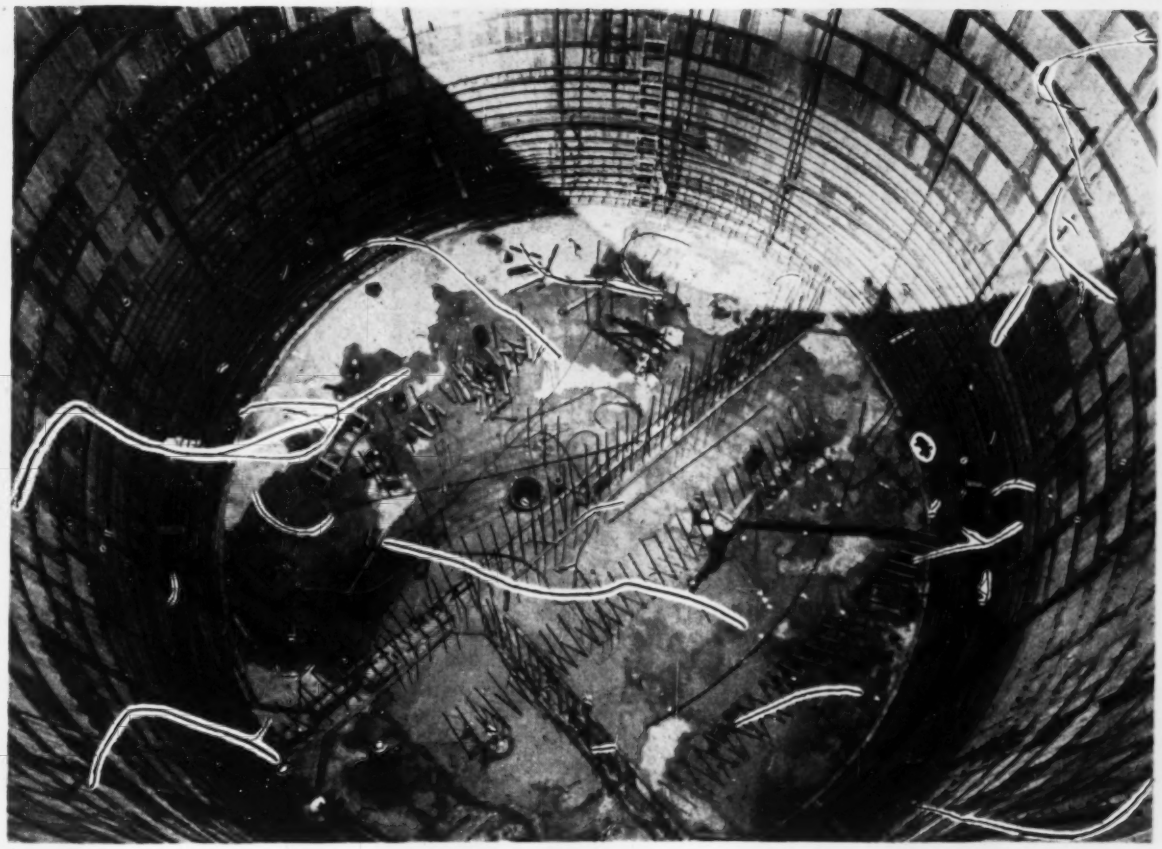
Peiping, capital of Communist China, will again be an inland port and have connections with such large cities as Shanghai, Hangchow, Wuhan, Chungking and Chengtu by water, as well as rail and road.

Shipping as large as 2,000-ton motor barges will be able to travel the length of the Grand Canal. This will lessen the freight burden borne by railroads.

The provinces through which the Grand Canal runs will have the responsibility for rebuilding it. Half the canal's length is in Kiangsu province.

Kiangsu's share of the work will involve handling some 24 million cu yd of earth and building nine large locks, five regulating locks, two big ports and many dock facilities. First draft plans specify that the channel in Kiangsu province be at least 148 ft wide and 11 ft deep.

The Grand Canal was begun in 5th century B. C. and was extended several times between 600 and 1300 A. D. It was completed in 1414. The canal fell into disrepair in the 19th century.



New open shaft, ring waler construction bottoms-out in 29 days

Open shaft construction made possible through the use of COMMERCIAL steel ring walers is proving to be an important boon to time-conscious contractors concerned with sub-grade foundation jobs. Another typical case in point is the foundation for the East Nine Mile Pumping Station in the City of Warren, Michigan.

72-FT. DEEP EXCAVATION is shored by 24 nine-segment COMMERCIAL steel ring walers and wood lagging.

Sunk in hard ground of stiff, moist blue clay, the lined open shaft for the foundation—72′ deep with an inside diameter of 55′ 10″—was bottomed-out and concreted by the Greenfield Construction Company in just 29 days. And according to James F. Peters, Field Engineer for Greenfield Construction, "COMMERCIAL steel ring walers, and the open shaft construction they made possible, were a most important factor in the on-schedule completion of our foundation project."

Unusual? Definitely yes when you consider that caisson-type construction used for foundations in this area in the past has frequently involved delays of months and even years because of soils too hard to allow caissons to pass.

Field Engineer Peters commented, in fact, that, "The ground on our particular project was so hard that I feel if we had used a caisson as originally planned it would have 'hung up' at a depth of approximately 25 feet."

The use of COMMERCIAL steel ring walers also eliminated the need for outside forms on the concrete for the project since the rings (set 3′ center-to-center) and wood lagging served as a form. The close tolerance fabrication (dimensions to + or − 3/8″) of the walers, their easy handling, and still easier installation, not only helped speed progress on the job but involved the services of only four men for actual installation.

For the full story on how COMMERCIAL steel ring walers can work to your time-saving advantage on open shaft or open pit construction for foundations—whether they be large or small—be sure to send for your copy of descriptive Bulletin 300-P1. Address inquiries to Commercial Shearing & Stamping Co., Dept. E-12, Youngstown 1, Ohio.

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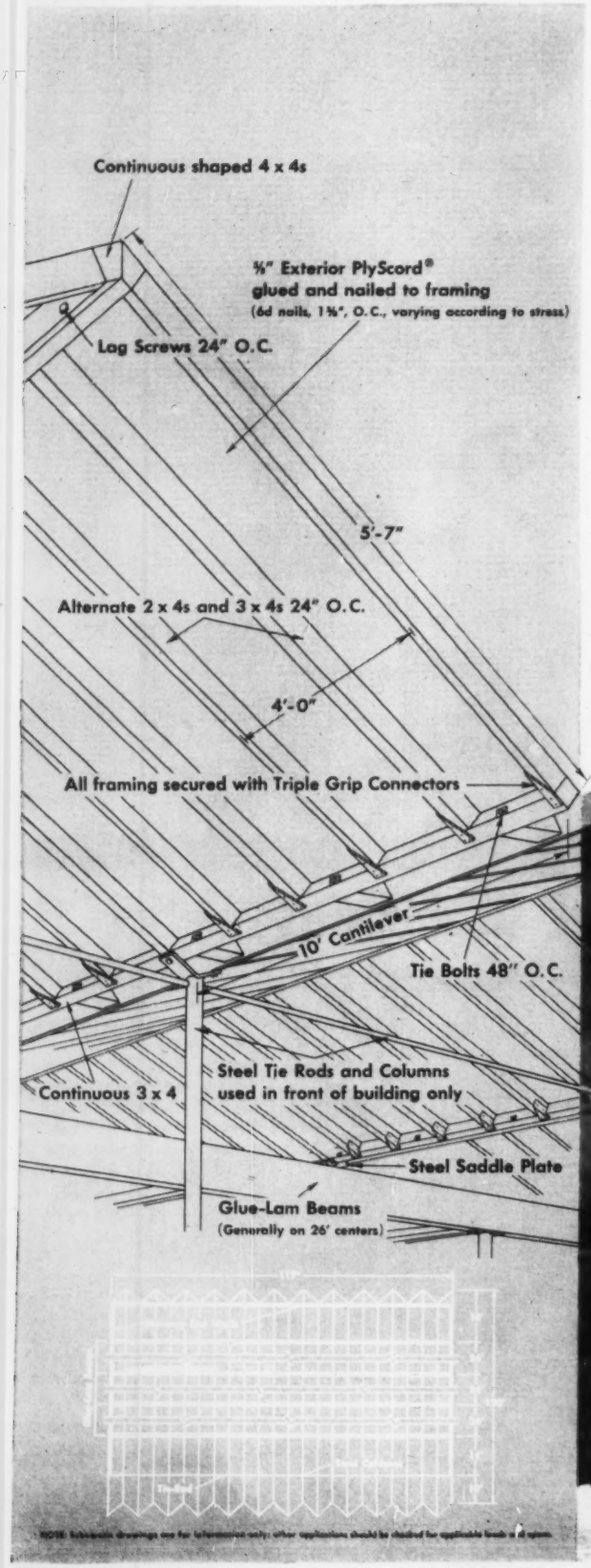
New low-cost covers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5'-7"
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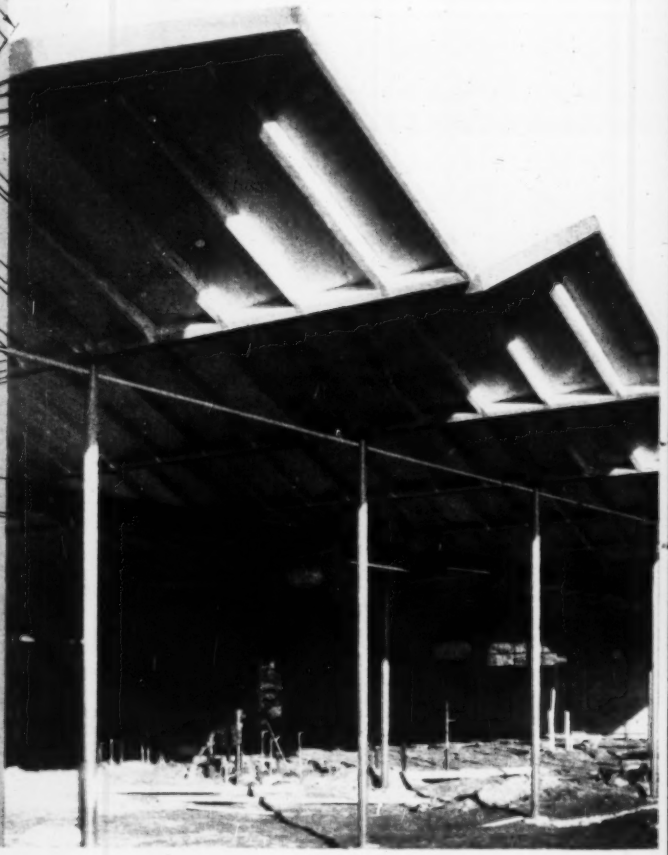

fir plywood folded plate roof 14,000 sq. ft. in only 9 hours

Fabricated on the job with common labor, new roofing system costs 10-20% less than conventional construction—provides attractive appearance, superior structural values.

THIS PRECISELY ENGINEERED folded plate roof—the first of its kind using lumber-framed plywood sections in series—offers several unique advantages:

Low cost and fast job-site assembly using common labor. Plywood components were installed by a 6-man crew in less than nine hours. Total costs, including all labor and materials, came to less than 80¢ per square foot—a figure some 10 to 20 percent less, locally, than joist or truss construction accomplishing the same clear floor area.

Structural simplicity. The roof consists of 11 plywood folded plates which rest on four glue-lam beams. Each of the inclined planes is a rigid plywood diaphragm, paired to form a giant self-supporting inverted V-beam which spans 10 feet from valley to valley and 26 feet from beam to beam. Posts, trusses and purlins are eliminated and the architect estimates that spans could be almost doubled where called for by the design.

Design adaptability. The plywood folded plate system provides large, clear floor areas and freedom in arranging—or rearranging—interior partitions. The folded plate creates an unusually attractive profile, with bays defining individual store areas.

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Fir plywood folded plate components were built on ground, crane-lifted into position in pairs. Heaviest lift was about 1,000 lbs. Contractor was impressed with the ease with which his crew assembled and erected sections.

The folded plate provides distinctive profile, freedom in placement of interior partitions. The front was given a 10 overhang to cover store entrances. Underside was covered with medium density overlaid plywood to provide smooth, check-free paint base.

On Friction Between Pavement and Base

B. K. Hough
Consulting Engineer
Ithaca, N. Y.

Base friction—friction between a pavement and the supporting base course—can be objectionable in some cases, desirable in others.

It is desirable in resisting pavement expansion. It is objectionable when contraction occurs since cracking usually results. For example, if base friction could be reduced to zero for a brief period after a slab is cast, shrinkage-cracking, for one, might be eliminated.

How much frictional resistance will develop in a given case depends in large measure on the material with which the pavement is in contact. And rigid pavements are usually constructed on coarse-graded material capable of developing solid friction, i.e. a frictional resistance proportional to normal (perpendicular) pressure.

In addition there will be friction due to interlocking if the concrete enters the surface voids of the coarse-graded base.

The ordinary causes of horizontal strains in the pavement itself are chiefly water content and temperature variations in the pavement materials.

An increasingly important new cause of horizontal strain in rigid pavements is compression of the concrete during prestressing. And it is in prestressed pavement construction that base friction becomes most objectionable. Because of base friction, there is every reason to believe that from point to point in the pavement there are significant variations in compressive stress.

This, of course, doesn't make for a good pavement. In addition, base friction forces the use of more initial prestress than would otherwise be required to obtain a given residual minimum compression. Hence larger jacks, strands, abutments and other similar features are required, increasing the cost and difficulty of constructing prestressed concrete pavements.

• **Attacks on base friction**—Efforts to alter troublesome base friction have so far been alike in their main objective: to provide a more-or-less permanent reduction in the coefficient of starting and/or sliding friction between the pavement and base. (The first must be overcome to put the body in motion; the second, to keep the body in motion.)

There are a number of common procedures to minimize the friction-producing interlocking between concrete and base course.

The usual remedy is to choke the surface voids in the base course with finer material and cover the base with building paper before casting concrete. This substantially reduces interlocking. But it doesn't eliminate it completely.

Also, though starting friction is re-

. . . Pavement Is 'Floated' to Beat

Author Hough continues . . .

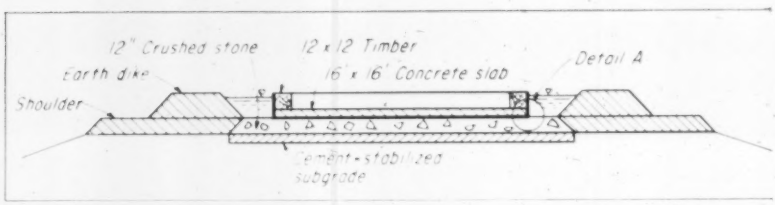
A proposed new method to do away with undesirable friction between concrete pavement and base course during construction is to "float" the slab by flooding the base course with water.

Development of the "flotation" method involved recognition of the fact that the frictional force between solids is not dependent solely on the coefficient of friction. Rather it is the product of both the coefficient and the normal (perpendicular) pressure on the plane of sliding.

Whereas the friction coefficient can probably never be reduced much below 0.5, the normal pressure can, at least theoretically, be reduced to zero.

It is on this latter basis that there is prospect of eliminating base friction—friction between pavement and base course—completely, if and when desired. One especially desirable instance would be during prestressing to achieve even compression throughout the slab.

Reducing normal pressure on the sliding plane can be done in several ways. One is to apply a slight hydrostatic pressure on the underside of the slab, as in mudjacking. It takes a pressure of only 14 in. of water, for example, to offset the weight of a 6-in. slab.



The procedure developed and used by the author in recent tests for creating this pressure was: fill the crushed-stone base course with water, and then raise the water level in a surrounding diked section to create the desired head.

A soil-cement subgrade was used in the test section. This stabilized the clay subgrade so that the base course could be temporarily filled with water.

A 12-in., crushed-stone base course was placed on the 6-in. soil-cement.

The concrete pavement slab used was 16 ft square and 6 in. thick. It was of conventional unreinforced concrete.

Base friction was observed under three different conditions:

• **With hydrostatic uplift** approximately equal to the weight of the slab.

• **With zero uplift,** but with base friction minimized by a friction-reducing layer.

• **With zero uplift** and maximum base friction.

For the first two tests, the base course was covered with sisalcraft paper, felt and plastic sheeting. The slab was then cast and the dike constructed around the slab.

A 12 x 12 timber curbing was placed around the edge of the slab. The plastic sheeting was turned up and over the curbing to provide for a head of 18 in. above the base of the slab.

In the first test, water was pumped into the diked area, filling the base course and creating pressure on the underside of the slab.

Weight of the slab and timber curbing was estimated at 22,000 lb. Indications were that a head of 16½ in. of water would be needed to reduce normal pressure on the base to zero.

When the head reached approxi-

duced, the problem of sliding friction still remains. Attempts to reduce this form of friction have included the use of a layer of sand between the slab and the base course.

However, even under the most favorable conditions, it appears impossible by use of such material to reduce the coefficient of sliding friction to less than 0.5.

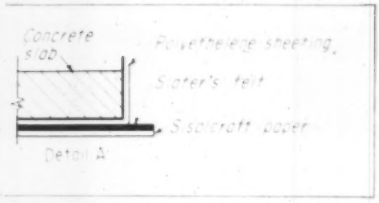
• **A new way**—But, at this point, this question should be raised: Should a permanent "built-in" reduction in base friction—if it could be attained—be sought? As previously stated, the presence of friction can be desirable after construction.

There is also doubt that the reduction needed during construction can be obtained most effectively through modifying the friction coefficient.

In view of this, the author has developed an alternative method of dealing with base friction.

The new method involves "slab-flotation"—or "lifting" the slab from the base course during construction (see below).

Friction



mately 15½ in., a 600-lb pull caused the slab to move. At 2,000-lb pull, the slab moved more or less uniformly.

The head was then increased to approximately 16½ in. And the slab could be moved by merely pushing it by hand.

In the second test the hydrostatic uplift was removed by draining the water. It then took a pull of between 8,000 and 12,000 lb to start the slab and keep it moving.

In the third test, a new slab was cast directly on the base course. The force needed to move this slab exceeded the capacity of available equipment. Full capacity of the measuring dynamometer used—25,000 lb—was reached. Full capacity of a 50-ton winch was exerted, and still there was no movement.

Applied force was easily more than

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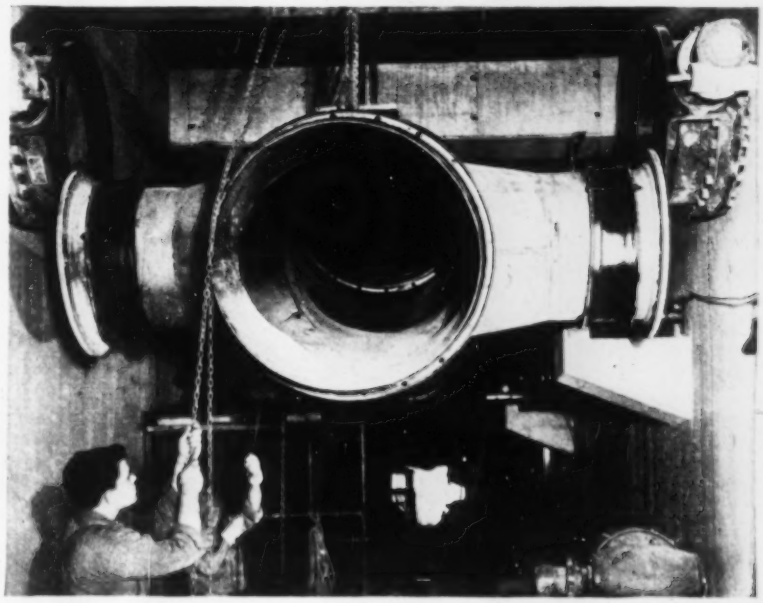

This is a cross on the main intake line at the new Clague Road Filtration Plant, Cleveland, Ohio. Designed by Havens and Emerson of Cleveland, the plant will have a normal flow of 50-million gpd. Hunkin-Conkey Construction Company is the contractor.

You don't need much leeway...the Dresser way

Not only was it the *easy* way, Dresser Couplings were actually the *only* practical way to install this steel cross on a filtration plant's main intake line. Note how little leeway exists between the valves and the pipe flanges. Bolting up would be impossible if the bolt holes were just a fraction out of line, but the Dresser method gives you the necessary "play". Settling concrete could change the valve centers, but the non-rigid Dresser Couplings will take deviation and remain bottle-tight . . . permanently. When you join pipe the easy way, it's the least expensive way . . . with Dresser Couplings.

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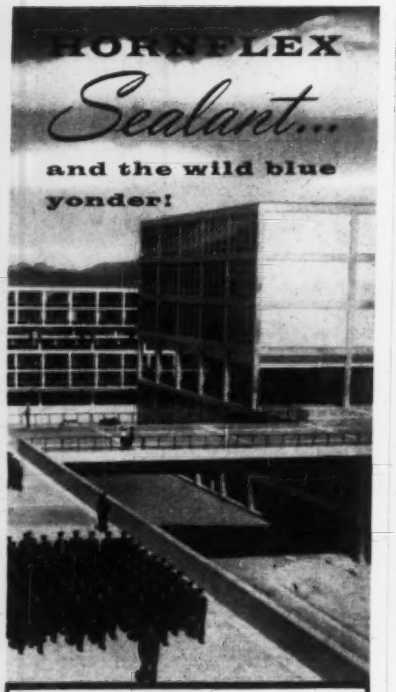

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25,000-lb—and may have been as much as 100,000 lb.

Here is a summary of the results of these tests:

Test condition	Total pulling force, lb	Total slab weight, lb	Coeff. of Friction
Slab flotation (approx. 16½ in. head)	0	22,000	
Friction reducing layer	10,000 (approx.)	22,000	0.5±
Slab directly on coarse-graded base	100,000 (approx.)	22,000	5±

The results of the last two tests agree reasonably well with previously reported data. They show that with roughness minimized, the coefficient of sliding friction can be reduced to approximately 0.5. Also, that unless steps are taken toward eliminating interlocking, the coefficient of starting friction may be as great as 5.0.

The tests also indicate that a sand layer may not be required to reduce coefficient of sliding friction to 0.5. The use of a suitable paper or other inter-layer between slab and base to eliminate interlocking may be sufficient to do the job.

The chief value of the tests, however, is the demonstration that base friction can be eliminated completely and then restored.

In actual pavement construction, confinement of water under the slab could be accomplished by bringing the shoulder of the road up to the edge of the slab and temporarily placing enough additional fill along the edge to prevent leakage.

When the problem of transverse and longitudinal pavement slopes occurs, fill could be placed over the lower sections of the pavement prior to base flooding. Then a balance between hydrostatic pressure and weight of pavement plus fill can be obtained at all points.

• **What's its future**—At this stage, it is difficult to estimate the practical value of the proposed method and the extent to which it can or should be used in full-scale pavement construction operations.

Despite its demonstrated effectiveness, the method has certain apparent disadvantages and is subject to certain criticism. One is that flooding of the base course appears to violate established rules of good pavement construction.

It may be possible to show, however, that this objection is more a matter of ingrained habit and instinct than of logic. Providing due precautions are taken—such as subgrade stabilization and use of an open-graded base course material—it is believed that a temporary, short-duration flooding of the base course will not hurt the eventual service behavior of the pavement.

These two requirements—subgrade stabilization and coarse-graded base—can scarcely be considered unusually burdensome in any form of high-type pavement construction.

Since adverse base-friction effects are greatest in prestressed pavement construction, the greater use of such pavements should lead to further development and utilization of the new method.

The slab flotation method was developed by the author in connection with design studies for a prestressed concrete taxiway for the U.S. Naval Air Station, Niagara Falls, N. Y. The studies were under the District Public Works Office, Third Naval District, Bureau of Yards and Docks. Capt. J. G. Dodd, CEC USN, is officer in charge.

The tests were conducted under a contract with the district office.

Florida Building Groups Organize Research Unit

Research for improved building construction is the objective of the newly formed Florida Foundation for the Advancement of Building.

The idea for the foundation emerged from conference among representatives of the Associated General Contractors, the Florida Lumber & Millwork Association, the Department of Building Construction of the University of Florida and the Florida Association of Architects.

Agreeing that no single group could undertake the job alone, they organized the foundation to help Florida's building industry cooperate in solving industry problems.

Research will be conducted in these fields.

- Performance of building materials and structural systems.
- Improved design and use-standards for buildings.
- Improved building equipment and methods of building erection.
- Better organization and business methods for the building industry.

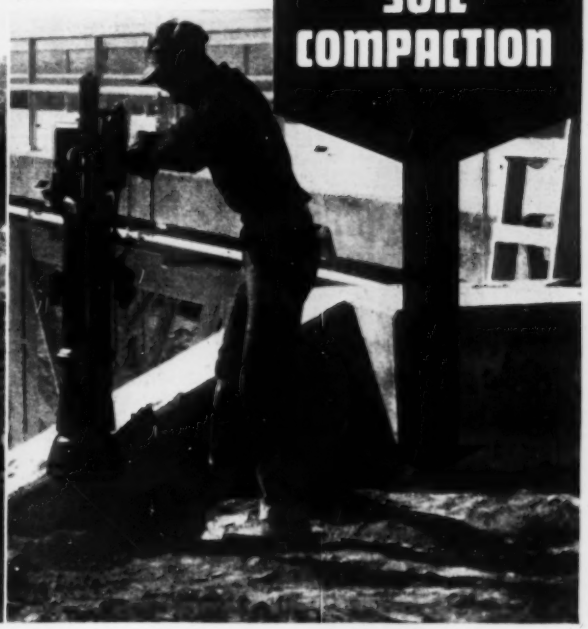
The foundation was formed with an eye to Florida's rapid growth. The $1 billion now spent annually on construction in the state is expected to reach $1.6 billion by 1970; population, now 4.4 million, should top 7 million by 1970. Foundation research will be aimed at improvements in design and efficiency of production to keep pace with this expected growth.

(*Research & Development p.* 140)

Where SPECIFICATIONS call for . . .

PHOTOS: *Left*—Tamping fill around 4 ft. concrete pipe culvert on New York State Thruway Extension near West Seneca, N. Y. *Right*—Compacting earth fill around abutment on Benbrook Dam construction near Fort Worth, Texas.

HIGH DEGREE SOIL COMPACTION



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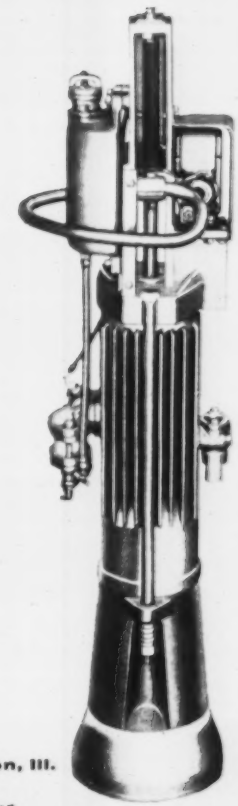

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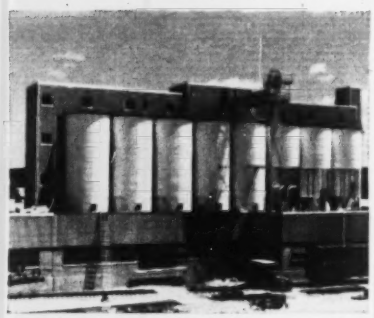

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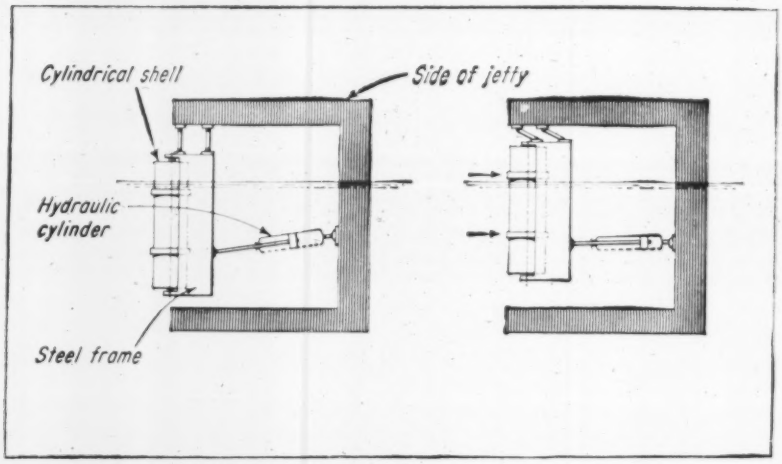

Ship impact is absorbed by fender where . . .

Seawater Is Hydraulic Fluid

A hydraulic fender to cushion a ship's impact on a jetty has been designed and patented in England.

The unit consists of three cylindrical shells mounted vertically in a steel frame. This is hung in a cutout in the side of the jetty with pairs of parallel links.

Two hydraulic cylinders—placed in a horizontal position and below the waterline—are linked to the rear of the frame and the jetty. The direct-acting cylinders use seawater for their operation.

When a ship strikes the protruding shells, the steel frame is pushed into the jetty. This causes pistons to displace water in the cylinders, which have a number of holes for entry and escape of the liquid.

The resistance of the hydraulic system—which builds up with progressively increasing force—checks the ship. The gravitational force resulting from the heavy unit being off center also helps.

When a ship strikes the fender a glancing blow, the cylinderical shells spin in their frame to keep from damaging the ship. Circular bands of elm wood or rubber on the shells prevent damage to paintwork.

Another model of the fender system is fitted with oil-operated hydraulic cylinders. These are mounted vertically above the waterline and are actuated by a toggle arrangement.

Scale models of the roller fender have been successfully tested. Full-size shells can vary from 10 to 30 ft high.

The hydraulic fender has been designed by W. M. Hutchison and K. W. Hopkins of the BP Tanker Co. World rights for manufacture, sale and installation are held by Brown, Lenox & Co. (London) Ltd.

Planes to Leave Electronic Spoor

The goal is precise electronic control of an arriving aircraft from the time its wheels touch the runway until it is parked and discharging passengers—even under the most adverse weather conditions.

First step is an experimental project soon to be tested by the Bureau of Research & Development, Federal Aviation Agency. It will use elements of the electronic highway traffic control system under development by the Radio Corp. of America (ENR Jan. 16, 1958, p. 27).

This system—tested for vehicles last year—employs a series of wire loops and small detector units buried in the pavement. A car passing over a loop generates an electrical signal. This is received by the detector and used to activate some other electronic control device.

For the airplane traffic control test, the detector circuits will be buried in runways and taxiways. As the planes roll over them, the detectors will operate indicator lights on a central panel. In this way, the traffic control man will know the position of all planes at all times.

The test installation is going in at the recently established National Aviation Facilities Experimental Center, Atlantic City, N. J. It will be used to keep tabs on aircraft taxiing, landing and preparing for take-off.

No special equipment will be needed in the planes. The system is expected

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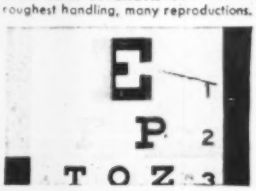

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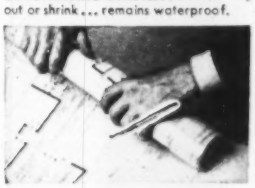

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Now you can safeguard your investment in costly original drawings by using the new pencil and ink drafting films made with Du Pont "Mylar"* polyester film. What's more, these tear-resistant drafting films *cost no more* than many grades of cloth!

Look at the remarkable combination of benefits found in these new drafting films! They resist cracking . . . won't embrittle with heat used in reproduction . . . won't yellow with age . . . won't soak up moisture or grease from hands . . . remain waterproof. Next time you order, specify drafting film made with "Mylar."

*"Mylar" is a registered trademark for Du Pont's brand of polyester film. Du Pont makes the base material "Mylar"—most leading manufacturers of drafting materials are now offering pencil and ink drafting films made with Du Pont "Mylar".

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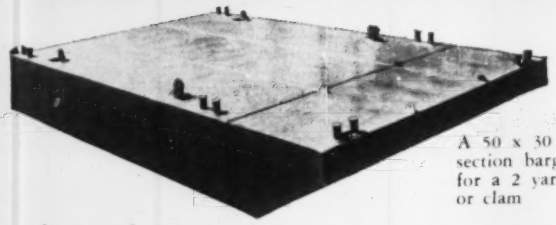
DU PONT MYLAR® POLYESTER FILM

MANITOWOC
SECTIONAL BARGES



A 50 x 30 foot four-section barge suitable for a 2 yard dragline or clam

- For floating all sizes of lift cranes, clams, draglines and other contractors' equipment.
- Easily assembled or knocked down for moving by rail or highway.
- Sections can be assembled into numerous barge sizes.
- Spuds, deck fittings, loading ramps and other accessories available.

Above, a sectional barge completely assembled with crane, spuds and deck equipment ready to go to work.

Designed for the contractor who needs low cost, flexible and portable floating equipment, a typical clam operation performed from a sectional barge.

Write for additional information and prices.

Sold direct or through Manitowoc Engineering Corporation distributors.

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To speed mail delivery, the Post Office has created postal delivery zones in 106 cities. Be sure to include zone numbers when writing to these cities, and always include your own zone number in return addresses—after the city, and before the state.

to be able to work under landing speeds of up to 175 mph and taxiing speeds up to 65 mph. The experimental system will be able to track up to 20 planes simultaneously.

Contract for the system has gone to General Railway Signal Co., Rochester, N. Y. RCA's Industrial Electronic Products is subcontractor.

$5,000 Research Grant Is Established by ASCE

An annual fellowship of $5,000 for basic research in civil engineering has been announced by the American Society of Civil Engineers.

The ASCE research fellowship will be awarded on the basis of scholastic record, ability to conceive and explore original ideas, and a description of the proposed research and its objectives.

An applicant must submit a statement from the institution where he plans to do his research that he and his project are acceptable to the institution.

ASCE will give preference to research that is basic in nature and concept, rather than applied, or developmental.

The recipient of the grant will be required to devote full time to the proposed research during the year of his grant. He will be required, also, to submit a report on his research, suitable for publication, to ASCE on completion of his fellowship.

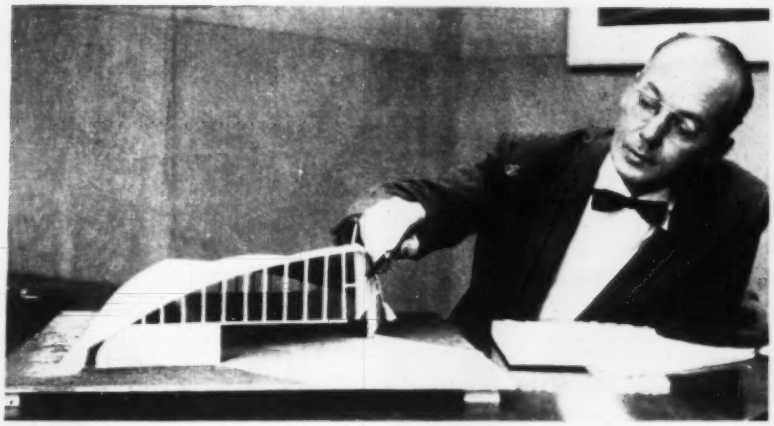
Applicants must be members of ASCE, citizens of the U. S. and graduates of accredited curricula. Applications in specified forms will be accepted until Mar. 15, 1959. The award will be made by May 15, 1959 for a twelve-month period beginning not later than Oct. 1, 1959.

Pollutant Source Found in Complete Combustion

The process of complete combustion, instituted in many urban areas to reduce atmospheric contamination, has been found to be the source of another air pollutant—formaldehyde.

Researchers at the University of California, Berkeley, have discovered that large quantities of formaldehyde may be produced under conditions of complete combustion. They found a direct relationship between the amounts of the irritant produced and the amount of air made available during burning.

Production of formaldehyde can be almost eliminated through close control over the amount of air introduced into the combustion chamber, further studies revealed. By limiting air to no more than is needed for complete combustion, formation of both smoke and formaldehyde can be avoided.



BALANCED HANGAR is studied by Ideal Cement Co.'s chief engineer, George Wiley.

Hangar Hugs Plane's Shape

A Denver cement company plans both to advertise its product and protect its new executive airplane at the same time.

Ideal Cement Co. will construct a diamond-shaped thin-shell concrete arch hangar at Denver's Stapleton Field. Weight of the entire building will rest on two heavy concrete abutments.

The roof slab will be 3 in. thick, measuring 108 x 160 ft. The building front will be 33 ft high; the rear will rise 24 ft. A center rib, 18 x 30 in., 160 ft long, plus edge ribs, will stiffen the structure.

The hangar is designed to accommodate Ideal's new Fairchild F-27. The plane has a wing span of 95 ft and its tail stands 27 ft high. The diamond shape of the hangar conforms closely to the shape of the airplane, thereby reducing waste space in the hangar to a minimum.

The two rear hangar walls will be 5 x 16-ft panels of precast concrete with translucent plastic between panel tops and the roof arch. Sliding doors will operate across the front of the hangar.

Design engineers for the project are Fisher, Fisher & Davis. Ketchum & Konkel are the structural engineers. The A. A. & E. B. Jones Construction Co. is general contractor. John Wood is project engineer for Ideal.

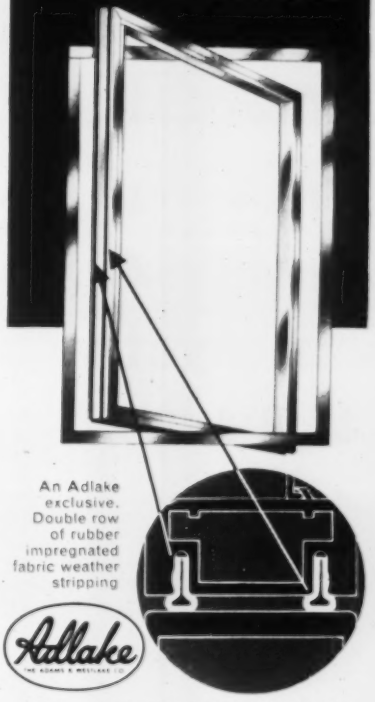
Stump Splitter Uses Dozer Tooth

Subcontractor Charles Peckham, of Vermont, made his own free stump-splitting tooth to speed clearing.

He attached a dozer blade tooth to the blade of his International TD-24. And for extra bite, he welded a manganese wedge to the dozer tooth.

(*Turn the page*)

Adlake
reversible windows
WON'T LEAK!



An Adlake exclusive. Double row of rubber impregnated fabric weather stripping

Adlake

Adlake—and only Adlake—is double sealed with a resilient, rubber impregnated fabric weather strip, permanently positioned in an aluminum binder. This seal has proved *impervious to the elements* in rigorous laboratory tests and in long years of service.

Cold and inclement weather will not affect this weather stripping. In all climates it keeps heated and conditioned air *IN*, water and outside air *OUT*.

That is one reason why there are nearly as many Adlake reversible aluminum windows in service as all other makes combined. Other reasons are: Adlake windows operate at a finger touch. They will never rot, rust, rattle, stick or screech. They will never need paint. Adlake guarantees satisfaction. When you install Adlake you know you are getting the best.

Let us send you the details about Adlake windows. Just write The Adams & Westlake Company, 1184 N. Michigan, Elkhart, Indiana.

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LIMA Roadpacker speeds highway and airport construction across the nation

The LIMA Roadpacker is a big favorite with prominent contractors throughout the country for highway and airport construction. It has no equal for fast, uniform consolidation by the vibratory method of single course macadam bases, gravel subbases and soil-cement bases.

The Roadpacker is equipped with six 420-lb. hydraulically driven shoes for effective vibrating and tamping action. These oscillate approximately ¼ in. at the proper frequency for best consolidation of any base material. The force is applied vertically to prevent shoving the material being consolidated. The sole plate is designed for both forward and backward operation.

Working widths—easily varied by upfolding one or both of the end shoes—range from 8 ft., 9 in., with four shoes, to 13 ft., 1 in., with six shoes. The shoes are raised and lowered hydraulically.

Get the full story on the LIMA Roadpacker today. See your nearby distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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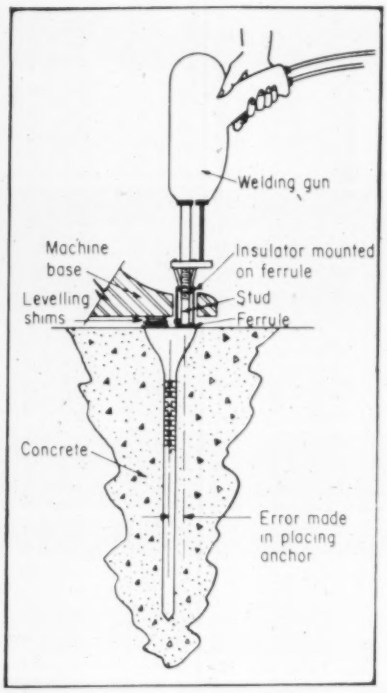


New Anchor System

Anchors set flush get threaded bolts welded when equipment is in place

A new design for masonry anchors for heavy equipment eliminates protruding anchor bolts. The system was developed by Howard M. McCollister of Midnapore, Alberta.

An anchor rod with a large flat head is embedded in the foundation before the concrete gets its initial set. The head of the anchor is left flush with the surface of the concrete. When the equipment is to be secured, it is rolled without lifting over the anchor rods. A threaded stud then is inserted through the bolt holes of the equipment base and spot welded to the flush head of the anchor. Finally the equipment is held down by tightening nuts on the studs.

The flat head of the anchor rod should be of sufficient size to allow for errors in the original placing of the anchor rods. The studs would be as effective welded to the outer edge of the rod head as when welded to the center.

Cost savings and increased job safety are advantages of the system, according to Mr. McCollister. The materials used cost more than the simpler types of anchor bolts currently in use, but he expects the system would produce a substantial reduction in labor costs. In addition, flush-head anchors would remove the accident-producing forest of

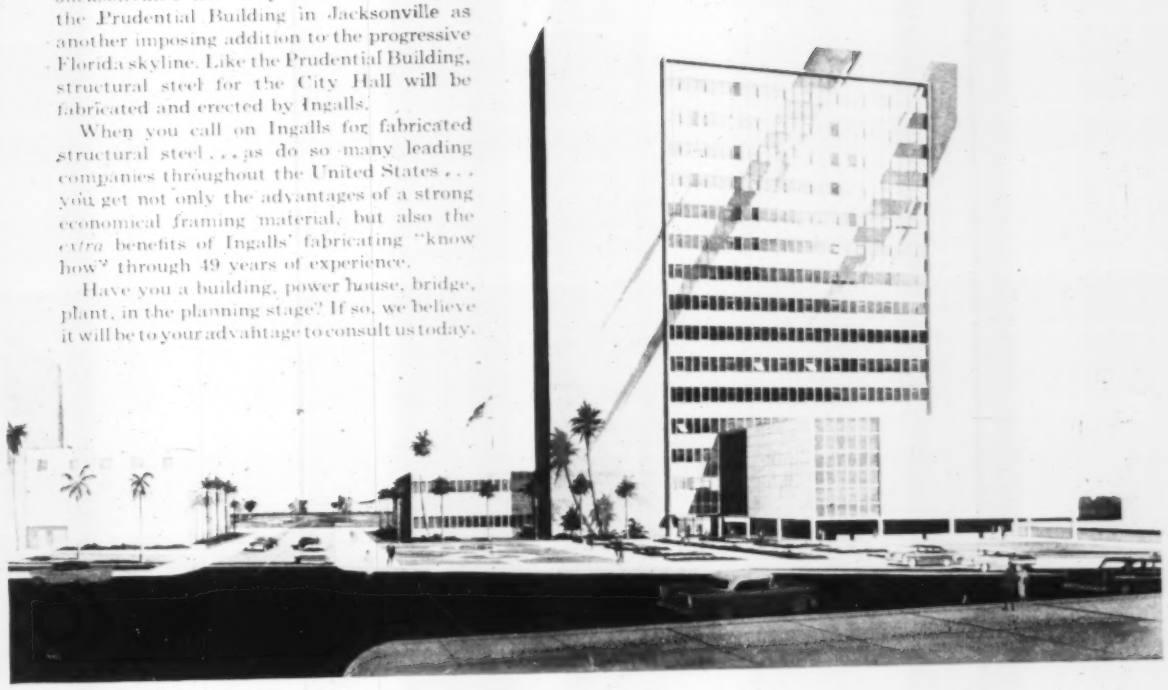
On the Florida skyline...

STRUCTURAL STEEL by INGALLS

Jacksonville's new City Hall will soon join the Prudential Building in Jacksonville as another imposing addition to the progressive Florida skyline. Like the Prudential Building, structural steel for the City Hall will be fabricated and erected by Ingalls.

When you call on Ingalls for fabricated structural steel . . . as do so many leading companies throughout the United States . . . you get not only the advantages of a strong economical framing material, but also the *extra* benefits of Ingalls' fabricating "know how" through 49 years of experience.

Have you a building, power house, bridge, plant, in the planning stage? If so, we believe it will be to your advantage to consult us today.



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Structural Steel Erection—The Ingalls Steel Construction Co.

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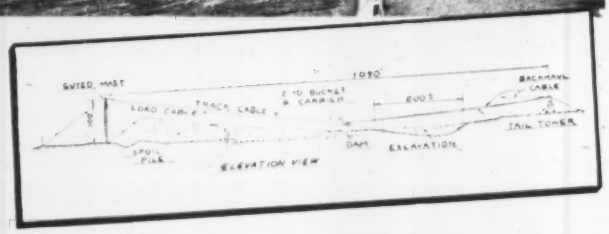
Three Sauerman Methods for Cutting Excavating and Reclamation Costs

DIGGING and CLEARING



Slackline Cableway—A 2-yd. bucket is used to maintain a clear channel to an irrigation project. The cableway digs the hard packed silt and conveys it to a spoil pile on the downstream side of the dam. Method permits removal of silt without wasting water.—*Sauerman News No. 146.*

STORAGE and RECLAMATION

DragScraper—Coal storage at this large eastern plant is provided by two 7-cu. yd. DragScrapers. New machine (left) parallels one in service for over 25 years. Buckets are shifted by remote control from stations above head-end monorail. Traveling tail towers provide lateral movement of buckets on coal pile.
—*Sauerman News No. 145.*

UNDERWATER TRENCHING

DragScraper and Crane—Here's how a DragScraper used with a carrier and track cable can extend the reach of any crane. This arrangement was highly successful in digging a trench for underwater pipe and backfilling after pipe was laid. —*Crane-DragScraper information is available in Field Report No. 228.*

Find out what the Sauerman Method can do for you

Give us details on your operation. Our engineers will give prompt recommendations and work with you to provide the best method for your requirements. Ask for Catalogs C (Slackline Cableways) and D (Coal Storage by DragScraper).

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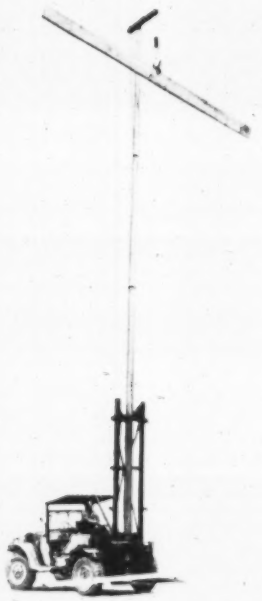
Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

bolts that cover equipment room floors during a construction job.

The new design received a 1958 Gregory Award Citation for application of stud welding at the American Society for Metals Convention in Cleveland, Ohio. The award is sponsored by Gregory Industries, manufacturers of Nelson Stud Welding equipment, in cooperation with ASM.



Boom and Fork-Lift On Fast-Travel Truck

A fork-lift and telescopic boom are mounted on a truck for versatile on-the-job use and fast off-job travel.

A war surplus Dodge weapons carrier supplied the truck motor and chassis for the "boomtruck." On this is a 40-ft telescoping boom hoist made by Remco Mfg. Co., Willits, Calif.

The hoist also actuates a fork-lift that can raise loads up to 11½ ft. Lift and boom fold down for long-distance travel.

Quipco, of Oakland, Calif., built the boomtruck for Berkeley Plywood Co. who supplied the specifications.

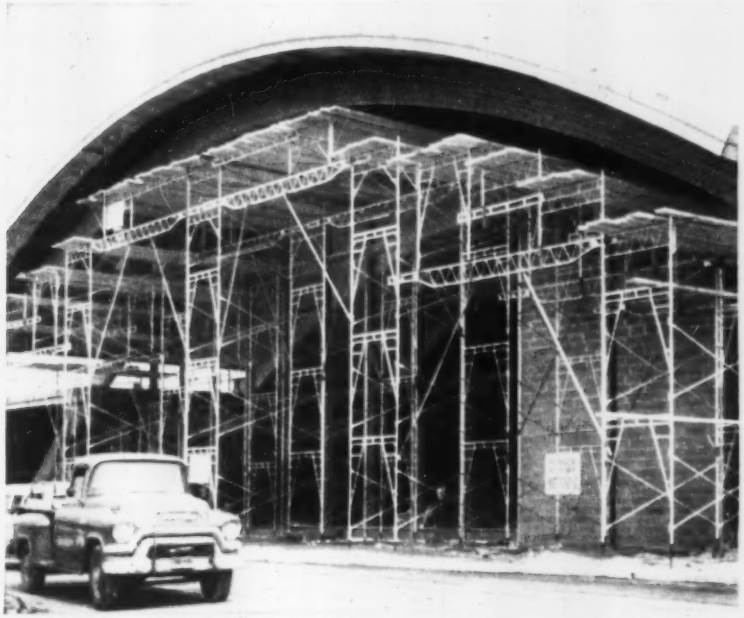
Headset Frees Hands for Writing, Turning Prints

Whenever two persons talk about plans on the phone, much of their time is spent waiting while the other person shuffles to the right sheet.

Fulmer & Bowers, Princeton, N. J., architects licked the problem by installing operators' headsets in their drafting rooms. The system leaves hands free to reach, turn and mark without putting the phone down.

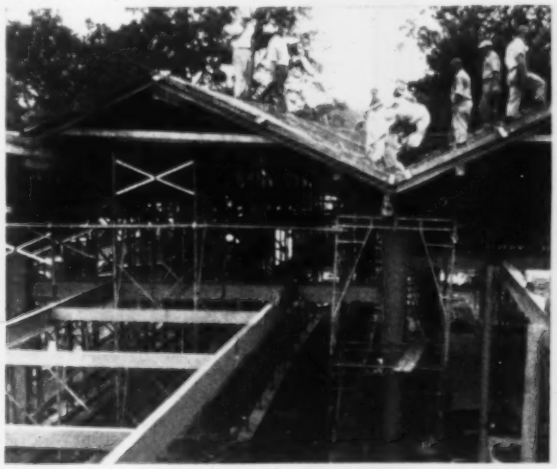
Scaffolding Methods . . . by Patent Scaffolding Co.

STEEPLE WORK PLATFORMS— Workmen for J. P. Roberts & Sons, contractor, guide into place a new steeple on this church. Wide, stable platforms made of "TubeLox"® Steel Scaffolding are built up rapidly.



PERFECT ACCESS FOR PLASTERERS— To give plasterers the right working heights at the underside of the curved, cantilevered roof of the Penn Fruit Building, Bergen Mall, Paramus, New Jersey, the contractor, Acme Plastering Company, uses "Trouble Saver"® Sectional Steel Scaffolding. First, frames are erected in towers. Then, they are joined by trusses which lock the units together and also make wide platform areas.

HEAVY PIER SUPPORT— On the North-South Ohio Turnpike, joint venturers, Kiewit-Condon-Cunningham, provide support for the formwork for these bridge piers by using "Trouble Saver" Shoring made from 2'-wide ladder frames erected to 26'-high towers spaced 5' apart. Built-in ladders provide easy access for forming work. 20" adjustable legs permit exact height adjustment.



SHORING A FOLDED PLATE ROOF— To make sure that the angle joints of this folded plate roof system do not move when the concrete, 4" to 6" thick, is poured, the contractor, Brick and Concrete Construction Co., uses "Trouble Saver" Sectional Steel Shoring placed to support the impact load on each adjoining folded plate section. New Charter Road School, Acton, Mass.

Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

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THE PATENT SCAFFOLDING CO., Inc.

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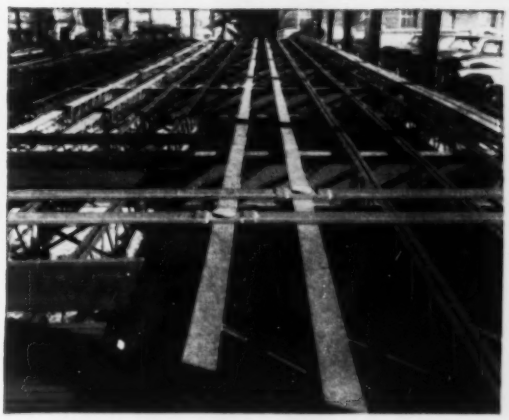
50¢ A SQUARE FOOT...

half the cost of the next most
economical quality system

The E. C. Joist is a standard Open Web Steel Joist with an electrical raceway substituted for the conventional top chord. Each E. C. Joist has the same load-carrying capacity as a comparable standard joist, and the same load table applies. Patents applied for.

LISTED BY U.L.—Ceco E. C. Joists are listed by the Underwriters' Laboratories for use with electrical header ducts and accessories manufactured by General Electric Company, National Electric Products Corporation and Walker Brothers.

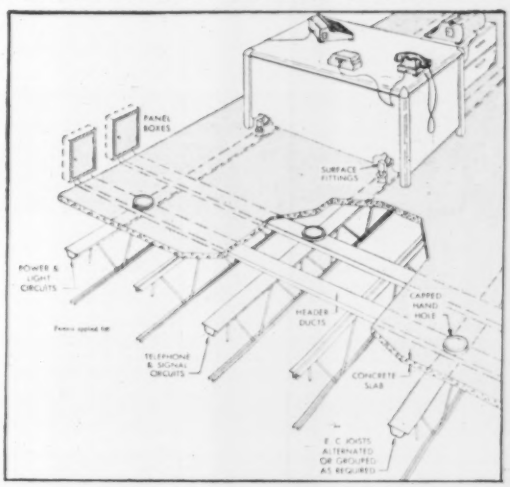
In this case, pairs of E/C Joists are alternated with pairs of standard joists at 18′ o.c., providing a two-duct system at 6′-0″ o.c. The header ducts here were installed during a 4″ snowfall, demonstrating that construction can proceed in bad weather. For full particulars fill in the coupon below and place in the mail.



E/C Joists can be substituted directly for standard joists to provide as many electrical raceways as desired. The two header ducts, shown horizontally in the foreground, feed wires into the E/C Joists through the hand-holes in the center of the photograph.

You save with Ceco Electro-Channel Steel Joists because they serve a double purpose...

A new product that reduces costs and increases utility makes welcome news. Such a product is the Ceco Electro-Channel Steel Joist, which provides raceway systems for top-quality underfloor electrification for as little as 50¢ a square foot. This is half the cost of the next most economical quality system. The saving is possible because E/C Joists do two jobs . . . carry the electrical as well as the structural loads. Included with the Ceco system are header ducts, hand-holes and markers, installed—as well as the E/C Joist integral raceways. The 50¢ buys a two-duct system on 6′-0″ centers, and represents the cost over and above standard steel joist floor framing. Comparable savings are offered in three-duct arrangements. Call your Ceco engineer or send coupon for manual. Ceco Steel Products Corporation—Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.



Electrical, telephone and signal wires can be run from the panel boxes down through the header ducts, into the top chord of the E/C Joist and up through the surface fittings to desks located anywhere on the floor. Whenever desks are moved, surface fittings can be placed along the joists to service the new positions.

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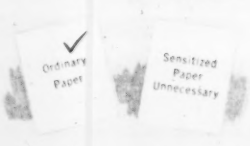

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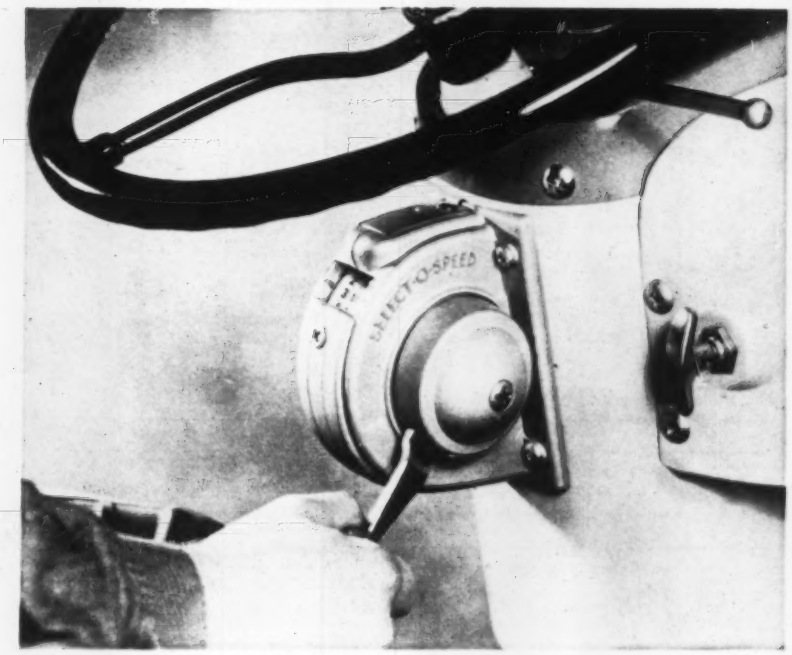
Low cost—proven savings to 70% . . . as much as $100,000 a year.



Tractor Speed Is "Dialed"

Ford calls its "Select-O-Speed" a totally new type of tractor transmission. It can be shifted "on-the-go" without use of a clutch pedal. It has ten forward speeds and two reverse.

The operator shifts from gear to gear by "dialing" with a small hand-controlled lever placed immediately below the steering wheel. The tractor continues to move during the shift operation.

The ten forward speeds overlap to keep the engine running at the most efficient throttle setting. Speeds from about ½ mph to over 18 mph can be picked, the manufacturer says. The transmission can be completely disengaged when the tractor is towed.

An inching control panel is located where the foot clutch is normally found. It allows the tractor to move gently and under precise control when the situation calls for it, the company states. The operator can also pre-select and set stops for any of five gears when the tractor is used in shuttle operations. Tractor & Implement Div., Ford Motor Co., Birmingham, Mich.

Steel Sheet Gets Vinyl Coat

The toughness of steel is combined with the appearance and feel of leather, linen and other cloth-like textures on newly developed vinyl-coated steel sheets.

U. S. Steel developed the plastic-bonded sheets. They are available for a variety of uses, including interior wall panels. They can be embossed with any texture that can be engraved on a printing roll and can be produced in a variety of colors.

Products made of this material can be fabricated in much the same manner as cold-rolled sheet without damage to the coating and without changing color, according to the manufacturer. The sheets can be deep formed, bent, split or punched without damage to the surface. The coating is reported to be mechanically and chemically tough, abrasion- and scratch-resistant and can easily withstand 30 elongation.

• **How they're made**—The plastic on steel application involves curing and bonding of liquid vinyl to sheets and coils—either cold rolled or galvanized in a continuous coating process. The coating can be embossed before cooling.

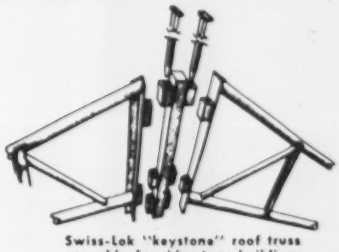
The vinyl is produced in controlled thicknesses of 0.008 to 0.020 in.

Vinyl-coated steel sheets are available in gages from 18 through 28. Widths

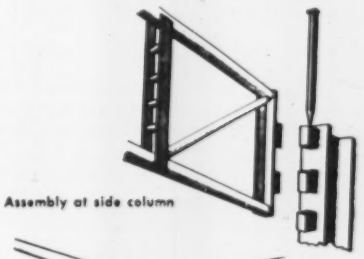
CUT YOUR COSTS with Swiss-Lok Tubular Frames

There's not a rivet heater nor an electric welder nor an acetylene tank in sight on a Swiss-Lok structural job! Nor the high cost, multi-task labor that performs all those field construction operations with conventional structural steel. The only tools required by the normal 5-man crew are two-pound hammers and a wrench for the foundation bolts.

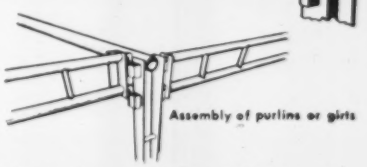
That work is all factory made of new steel pipe, to your building specifications by low cost production-line methods. Brought to the site by trailer truck and spotted at the point of erection, trusses, columns, purlins and girts are ready for crane lifting and locking into place by the tried and proven Swiss-Lok.



Swiss-Lok "keystone" roof truss assembly for ridge-type buildings



Assembly at side column



Assembly of purlins or girts

Simpler than a structural toy, Swiss-Lok assemblies are locked securely and rigidly into place, as indicated by these drawings.

You get ⅓ less steel weight (and ⅓ less freight), but a strength that exceeds A.I.S.C. standards. You get a rigid, self-aligning steel frame that permits use of any type roof and wall construction.

Many other impressive advantages of Swiss-Lok frames are covered in literature. Write for Bulletin 5128.

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Which compressor is best for you?

Take the guesswork out of your compressor operation, once and for all! Find out for yourself which compressor outperforms all others. Just rent a Schramm Portable Compressor and put it next to the types you are now using. Operate them identically; you'll be amazed at the difference. After a ten day trial, there'll be no question as to which compressor design is best for every construction job.

Here's what to look for when testing any compressor . . .

Operating Efficiency—A Schramm piston-type air compressor gives you full rated power—not just a fraction of it.

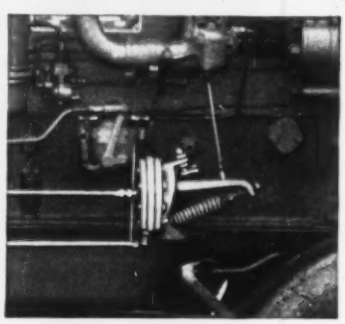
Fuel Economy—You use 15% to 50% less fuel with a Schramm Compressor because it's automatically regulated to match the exact air demands—no more, no less.

Handling Ease—Your men can easily move Schramm Compressors because they're lightest, smallest, most compact compressors made.

Yes, we'll put Schramm Compressors up against anything you now have. To rent a compressor for your own test, contact your local Schramm Dealer, or if you would like to know more about Schramm Air Compressors, write for Bulletin SPB-58. No obligation.

See the Yellow Pages for local Sales, Service and Rental of Schramm Air Compressors.

Schramm Portable Compressors are just right for air tools used by contractors to power backfill tampers, paving breakers, rock drills, trench and clay diggers, sheeting drivers.



Smooth, uninterrupted air flow—the Schramm Pneumastat, exclusive, patented air-delivery regulator, automatically controls the speed of engine and compressor in accordance with air requirements. Saves up to 50% in fuel costs.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

640 North Garfield Ave. • West Chester, Pa.

range from 24 to 52 in., lengths from 30 to 144 in. Vinyl-coated steel can also be supplied in coils. A maximum texture depth of 0.005 to 0.006 in. can be produced.

Vinyl-coated steel can be welded. But since vinyl itself is an insulator, current flow must be controlled from the back side. The steel sheets can also be fastened in many of the ways used for conventional steel.

• **What it costs**—Price variations depend mainly on steel gage and on quantity.

A typical price for .010 in. of single color vinyl on an 18-ga. sheet in quantities of 20,000 sq ft would be 35 cents per sq ft or about 2½ times the price of steel alone. The same vinyl on a 24-ga. sheet would be priced at about 24 cents and on a 28 ga. sheet the price would drop to 20 cents according to the manufacturer's spokesman. U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.

Vibratory Compactor Made For Payloader Tractor

A front-end vibratory compactor attachment is designed exclusively for four-wheel-drive "Payloader" tractor shovels. The self-contained and self-powered attachment is quickly interchanged with the bucket.

Each of four electric-driven compactor pads delivers up to 4,200 three-ton blows per min, the manufacturer states. Total compacting width is 10 ft. This is wider than the tractor tread, allowing compaction close to walls and borders.

Any of the shoes is quickly detached and used as a manually guided, self-propelled unit.

Regular hydraulic boom raises and lowers the attachment. Controls are handled from the operator's seat. Frank G. Hough Co., 772 Seventh Ave., Libertyville, Ill.

Waler Bracket Makes Safe Wooden Forms

The potential hazard of toe-nailed walers separating from the studs—a condition that has caused numerous scaffold accidents—is eliminated by the use of a new metal waler bracket.

The heavy malleable casting holds two 2x4 walers. It permits faster waler placement, according to the manufacturer, since it is applied independently of wall ties and clamps. It may be fastened on either side of stud, with three nails. Superior Concrete Accessories, Inc., 9501 King St., Franklin Park, Ill.

(*New Products continued p. 158*)

WINTER WRAPS—This 21-story office building is one of several now under construction along New York City's exclusive Park Avenue. Located at the corner of 55th Street, this modern edifice is being erected by the Kleban Realty & Construction Corporation. Because of the extremely high property value at this location and the urgency of the building's prospective occupants, speed of construction is essential. During the winter months, eleven huge tarps, measuring 20′ by 40′ are utilized as protective covering to enable workmen to progress regardless of weather. The tarps were supplied by Pearson Bros., Inc., New York City, and were made from Mount Vernon Duck.

This is another example of how fabrics made by Mount Vernon Mills, Inc. and the industries they serve, are serving America. Mount Vernon engineers and its laboratory facilities are available to help you in the development of any new fabric or in the application of those already available.

UNIFORMITY Makes The Big Difference In Industrial Fabrics

Mount Vernon Mills, inc.

A LEADER IN INDUSTRIAL TEXTILES

TURNER HALSEY COMPANY
Selling Agents

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Wherever Concrete Meets Concrete

FLEXCELL

REG. U. S. PAT. OFF.

NON-EXTRUDING EXPANSION JOINT FILLER

Does the job best!

New Enterprise Stone & Lime Co., Inc., had the job of building the 980,000,000 gallon Mill Run Reservoir and Dam placed in its capable hands by the city authority of Altoona, Pa.

"We used Flexcell on the spillway and its retaining walls," says Robert S. Over, New Enterprise Chief Engineer.

"Flexcell can take it," Mr. Over writes, "and can't be beat when it comes to easy, low cost installation!

Flexcell fiber board bonds firmly to concrete, compresses without extruding, re-expands to keep joints filled. Uniform asphalt impregnation. Tough, rigid, light in weight. Easy to cut and install. Fabricated to your specifications. Call your Flexcell distributor now.

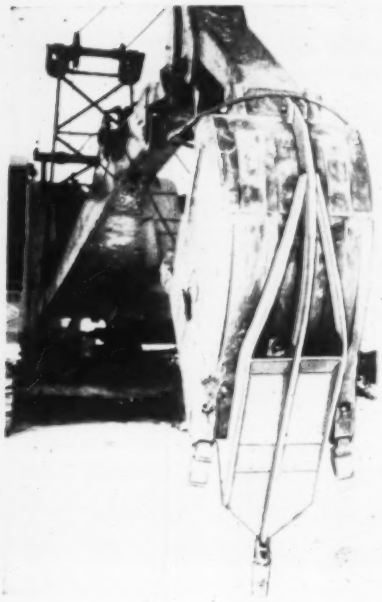
WRITE FOR SAMPLES AND NAME OF YOUR NEAREST DISTRIBUTOR

EXPANSION JOINT INSTITUTE

THE CELOTEX CORPORATION

120 SOUTH LA SALLE STREET • CHICAGO 3, ILLINOIS

. . . *New Products*



Backhoe Attachment Rips Frozen Ground

The "Rapid Ripper" attachment is designed to rip hard and frozen ground while digging at half-throttle, without damaging the backhoe boom or bucket.

It is said to dig through 30 in. of solidly frozen ground in 30 min. The device is attached to the bucket with one pin. Custom-made to fit all makes of buckets. RAPID RIPPER MFG. CO., 41 MILE ROAD, RACINE, WIS.

Three Capacities in One New Pump Announced

Three new Series 35 pumps for construction and materials-handling machinery have been announced.

Three different capacities are available through a choice of pumping cartridges. Without removing the pump from its mounting, capacity can be changed in the field by substituting the desired size cartridge.

High pressures and speeds permit size reduction of all hydraulic components and, consequently, reduction of system weight and required space. The pumps are 6⅛ x 5¼ x 6 in., exclusive of shaft extension and mounting lobes. Capacities of the cartridges at 2,000 rpm and 2,000 psi are 31.5, 37.4 and 43.5 gpm. Input horsepower ratings are 43.9, 52.0 and 63.2 respectively.

The SAE four-bolt flange pad arrangement is used for port connections. Two-bolt flanges of suitable design also may be used with the four-bolt flange pad. VICKERS INC., DETROIT 32, MICH.

(*New Products continued p. 162*)

PEELLE DOORS

for Nuclear Applications

INDUSTRIAL RESEARCH LABORATORIES, INC., Plainsboro, New Jersey
ARCHITECTS: SKIDMORE, OWINGS & MERRILL • GENERAL CONTRACTORS: TURNER CONSTRUCTION CO.

WHAT IT TAKES TO SUPPLY DOORS FOR NUCLEAR STRUCTURES

The engineering and functional aspects of doors used in hot cells, reactors, irradiation chambers and other nuclear structures pose many unusual problems that most door fabricators have never had to face.

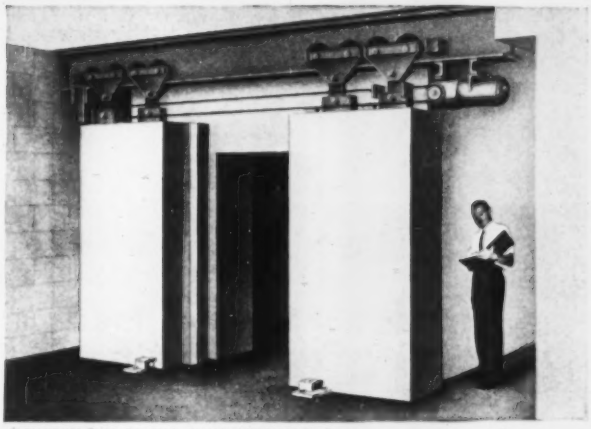
Materials of great weight and density are used in nuclear shielding doors. Such doors may be made of lead, steel, concrete – sometimes heavy aggregate concrete – and often of a combination of these and other materials.

A great wealth of design and engineering experience, gained in furnishing doors for X-ray rooms, high frequency sound laboratories, jet engine test cells and for some of the most prominent nuclear laboratories in the world places The Peelle Company in a strong position to engineer, fabricate and install the various types of doors required for nuclear facilities.

Write for color brochure containing photos and descriptions of an interesting variety of Peelle nuclear door installations.

HOT CELL DOORS AT PLAINSBORO, N. J.

The above battery of hot cell doors was photographed in the Industrial Reactor Laboratories for which Peelle engineered and installed eight nuclear shielding doors of various kinds. Photo at left shows one of these doors partially opened. Each of these doors weighs 26 tons and consists of a 3' thick steel shell filled with concrete and hung on massive steel hinges of superior design. A transfer hole in each door permits placing small objects in the cell while the door is closed.



ARCHITECTS & ENGINEERS: SHAW, METZ & DOLIO
CONSULTANTS: GENERAL NUCLEAR ENGINEERS, INC.

HOT LAB DOOR IN CARACAS, VENEZUELA

This Peelle center parting, horizontal sliding door in the I.V.I.C. Reactor Building is motorized. To provide extra hall space, the door panels were constructed of machined solid steel slabs, measuring 16" in thickness and weighing 15 tons. The opening frame consists of heavy steel slabs to provide proper shielding and interlocking.

ENGINEERED FOR THE BUILDING INDUSTRY
PEELLE-RICHMOND PRODUCTS

THE PEELLE COMPANY
47 Stewart Avenue, BROOKLYN 37, N.Y.
4037 N. Kedzie Ave., CHICAGO 18, ILL.
34 South 17th St., PHILADELPHIA 3, PA.
OFFICES IN PRINCIPAL CITIES

SONOCO Fibre Products

Save Time, Labor,

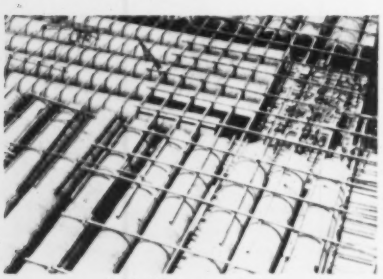
Voided bridge deck

By speeding construction, saving labor and materials, and by permitting new design and structural features, Sonoco Fibre Construction Products have proved valuable to contractors, architects, engineers and owners everywhere. Manufactured to exacting industry requirements, these products are backed by over 60 years of Sonoco experience.

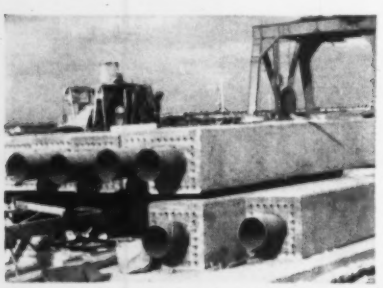
To Reduce Weight-To Lower Costs, Form Voids In Concrete Construction with SONOVOID® Fibre Tubes

The voided system in concrete construction is the best way to lower overall framing costs . . . and the best way to economize in man days on the job.

By displacing low-working concrete at the neutral axis, SONOVOID Fibre Tubes reduce weight in concrete floor and roof slabs, bridge decks, and in precast, prestressed concrete piles. The voided system saves concrete and reinforcing steel while maintaining structural strength.

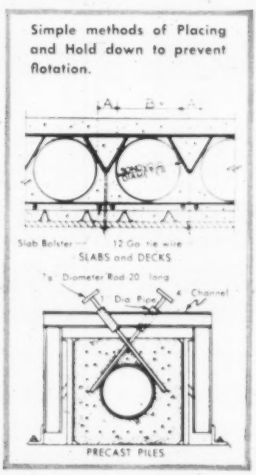

Voided floor or roof slab

Greater flexibility in design, less cubage, smooth ceilings, long span, smaller structural members . . . these are some of the extra advantages of lightweight voided concrete slabs in building construction. For bridge decks, the voided system gives great strength and rigidity in long spans, and provides greater ease of cantilevering.


Voided precast prestressed piles

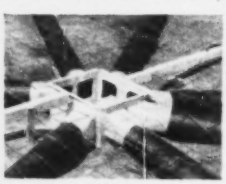
In precast, prestressed concrete piles, SONOVOID Fibre Tubes save materials and reduce weight so that the piles are more easily handled and driven.

Order SONOVOID Fibre Tubes in sizes from 2.25″ to 36.9″ O.D. Unless otherwise specified, shipment is made in 18 foot lengths (can be sawed). End closures available. Write for slab design tables and complete technical information.



MORE SONOCO FIBRE CONSTRUCTION PRODUCTS

DUROPIPE Bituminized Fibre Pipe. Regular or Perforated


SONOAIRDUCT Fibre Duct for slab perimeter heating

Pitch Treated Fibre pipe

SONOMOLD Fibre Concrete Test Cylinder Molds

Fibre Dowel Rod Sleeves

Reduce Construction Costs

Materials and Money!

Sonoco Fibre Products are low in cost and engineered for economical construction; they are subject to rigid quality control through every step of manufacture, from raw materials to finished product. Follow the lead of other successful contractors from coast to coast . . , use architect and engineer-approved Sonoco Fibre Construction Products and save time, labor, materials and money!

Form Round Concrete Columns Faster and More Economically with SONOTUBE® Fibre Forms

In buildings, schools, churches, parking garages, bridges, overpasses, or any structure where a round concrete column is to be formed, there is a SONOTUBE Fibre Form to do the job . . . faster and more economically than by any other method.

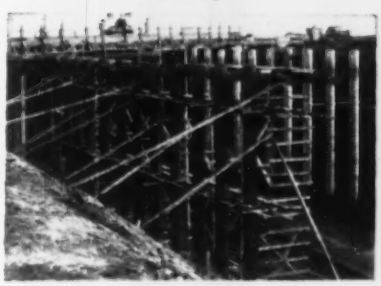
Because they are lightweight, easily handled and placed, and require only minimum bracing, SONOTUBE Fibre Forms save contractors time, money and labor. They can be sawed, punched for tie-in rods or reinforcing, and tied into other formwork. And, there's no storing, maintenance, or form cleaning with Sonoco SONOTUBE Fibre Forms.

Choose from 3 types:

Seamless (Pat. pend.)—a premium form for finished columns
"A" Coated—standard form for exposed columns
"W" Coated—for unexposed columns

Sonoco SONOTUBE Fibre Forms are available from 2" to 48" I.D. Unless otherwise specified, shipment is made in standard 18 foot lengths.

Formwork for round columns of concrete in building

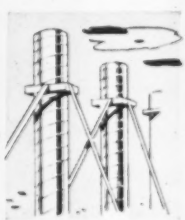


Formwork for round concrete piers for bridges and overpasses

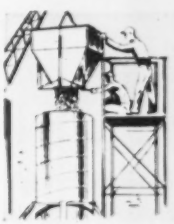
Lightweight and easy to handle

Can be sawed to size on the job

Place tubes by conventional methods



Only minimum bracing is required



Pour by normal method at normal rate

Stripping is easy and quick

- HARTSVILLE, S. C.
- LA PUENTE, CALIF.
- MONTCLAIR, N. J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D. F.

3752

SONOCO

Construction Products

SONOCO PRODUCTS COMPANY

Write for complete technical information and prices

Sonoco Fibre Construction Products are immediately available from distributors in all principal cities.

See our catalog in Sweet's

Keep water IN—
Keep maintenance DOWN!

Don't take chances with that costly swimming pool.

If it is made of concrete, it is porous—if it is porous, thousands of gallons of water will enter and finally deteriorate the masonry—causing it to crack.

Make the FIRST COST the LAST COST!

Ask your contractor to make sure it is watertight by using THOROSEAL to seal the surface. THOROSEAL is available in many attractive colors.

Thoroseal is not just a coating for masonry, it is a filling sealer that becomes a part of the masonry and protects it from deterioration.

"How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.

Clean Lines Stressed In Lightweight Bucket

A lightweight concrete bucket comes in ¼, ¾, 1, 1½ and 2 cu yd sizes. The bucket has all working parts above the discharge point and within the bucket outline to protect against falling materials and accidental bumping.

A short-stroke geared handle operates the all-welded-steel container. The handle does not protrude when in "closed" position. A 36-in.-long rubber discharge spout is available. C. S. JOHNSON CO., P. O. BOX 71, CHAMPAIGN, ILL.

Plastic Fittings Offered For Plastic Pipe Systems

A complete line of plastic fittings has been announced for plastic pipe with mechanical couplings.

The new fittings are molded in sizes from 1¼ to 8 in. in three materials—regular polyethylene, special high temperature linear type polyethylene, and polypropylene.

Complete piping systems can now be designed with plastic fittings, to match the piping material, for handling water, chemicals, inorganic acids or alkalies.

Elbows, tees, crosses, 45-deg laterals, reducers, caps and flanged adapter nipples for jointing to bolted flange systems are available in all three materials.

Though light in weight, the fittings are resilient enough to absorb shocks, blows and general on-the-job abuse, the maker says. Advantages claimed include also smooth internal finish to minimize flow friction and adherence of deposits. VICTAULIC CO. OF AMERICA, P. O. BOX 509, ELIZABETH, N. J.

(New Products continued p. 164)

SPACE PLATFORM

for American Industry

HYPERBOLIC PARABOLOID roof sections are composed of warped thin-shell slabs, cast in place. V-TETRAPODS (above) are four-footed diagonal supports for space frame, precast at the site. Concrete met specified strengths up to 5000 psi.

Rigid Space Frame Between Floors Gives New Plant Broader, Brighter Work Areas

● Quicker than you can say "multiple hyperbolic paraboloids on a V-tetrapod plenum," Texas Instruments Incorporated has a new, seven-acre plant in Dallas—an outstanding example of tomorrow's factory in operation today. It represents the first use in American industry of the "space frame" and the "umbrella roof"—two new architectural forms made practicable by the versatility of concrete.

The space frame—located between the administration-engineering floor below and the manufacturing floor above—acts like a giant, three-dimensional truss. Nine feet high and braced by slender, precast tetrapods, this rigid frame permits large 63-ft. bay areas on both floors, and contains all the pipelines which supply some three dozen utilities to any part of either floor through approximately 3,000 access holes.

The thin-shell concrete roof is formed of cast-in-place hyperbolic paraboloid sections—permitting exceptionally large, well-lighted areas with a minimum of columns, and producing a versatile structure which can readily be expanded in any direction by adding similar units.

The total result of this imaginative use of modern materials and methods was a quickly-erected, readily expandable structure with an easy, open atmosphere far removed from the dark factories of the past.

Semiconductor-Components Division
TEXAS INSTRUMENTS INCORPORATED
Dallas, Tex.

Architects:
RICHARD S. COLLEY, Corpus Christi, Tex.
O'NEIL FORD, San Antonio, Tex.

Associates:
A. B. SWANK, Dallas, Tex.
S. B. ZISMAN, San Antonio, Tex.

General Contractor:
ROBERT E. McKEE, INC.

Paving Contractor:
UVALDE CONSTRUCTION CO.

Ready-Mix Concrete supplied by:
WAMIX INCORPORATED

All of Dallas, except where indicated.

SPACIOUSNESS is the result of two architectural innovations, shown in the broad 63-ft. bays on the manufacturing floor.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

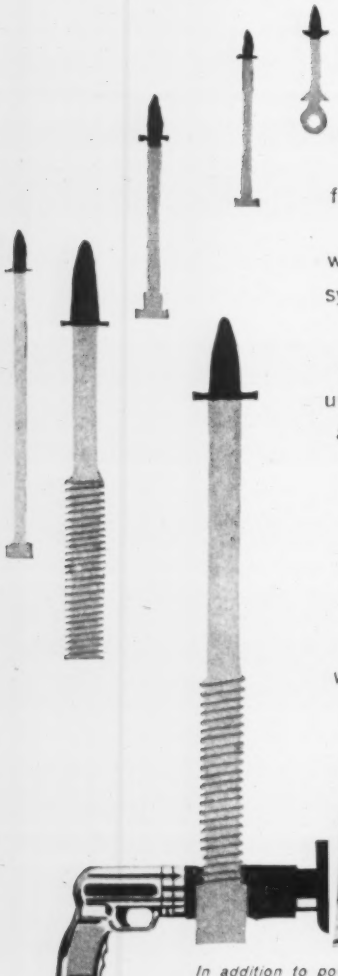
LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON INDIANAPOLIS • KANSAS CITY, MO. • LAKE CHARLES, LA. • NEW ORLEANS NEW YORK • NORFOLK • RICHMOND • SEATTLE • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS. 21 MODERN MILLS, 49,100,000 BARRELS ANNUAL CAPACITY

ONLY RAMSET

offers over 100 different powder-driven fasteners for specific jobs



Ramset, and only Ramset, offers a complete line of "job-fitted" fasteners . . . guarantees the most economical fastener for every application. Versatile Ramset is the best-known and most widely-used powder-actuated fastening system in the entire construction field.

In fastening to steel, concrete or masonry, Ramset tools are easiest to use . . . Ramset austempered fasteners are the best you can buy, and perform where others fail. Find out about the astounding savings . . . the absolute superiority of the Ramset Fastening System. Find your dealer's name under "Tools" in the Yellow Pages or write us direct.

Write for your copy of this handy fastener guide

In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set hammer-in tools for light fastening, and Ringblaster heavy-duty kiln gun.

Ramset® Fastening System

WINCHESTER-WESTERN DIVISION • OLIN-MATHIESON CHEMICAL CORPORATION
12107-C BEREA ROAD • CLEVELAND, OHIO

Spread Footing Form Added To EFCO Line

A spread-footing form for use with their regular wall-form panels has been announced by the maker of all-steel EFCO forms. The reusable forms are made in 1-, 2-, 4- and 8-ft lengths. Height of the units is 8 in. Spread forms for inside and outside corners are also available. Economy Forms Corp., P. O. Box 128, Highland Park Station, Des Moines, Iowa.

. . . Briefs

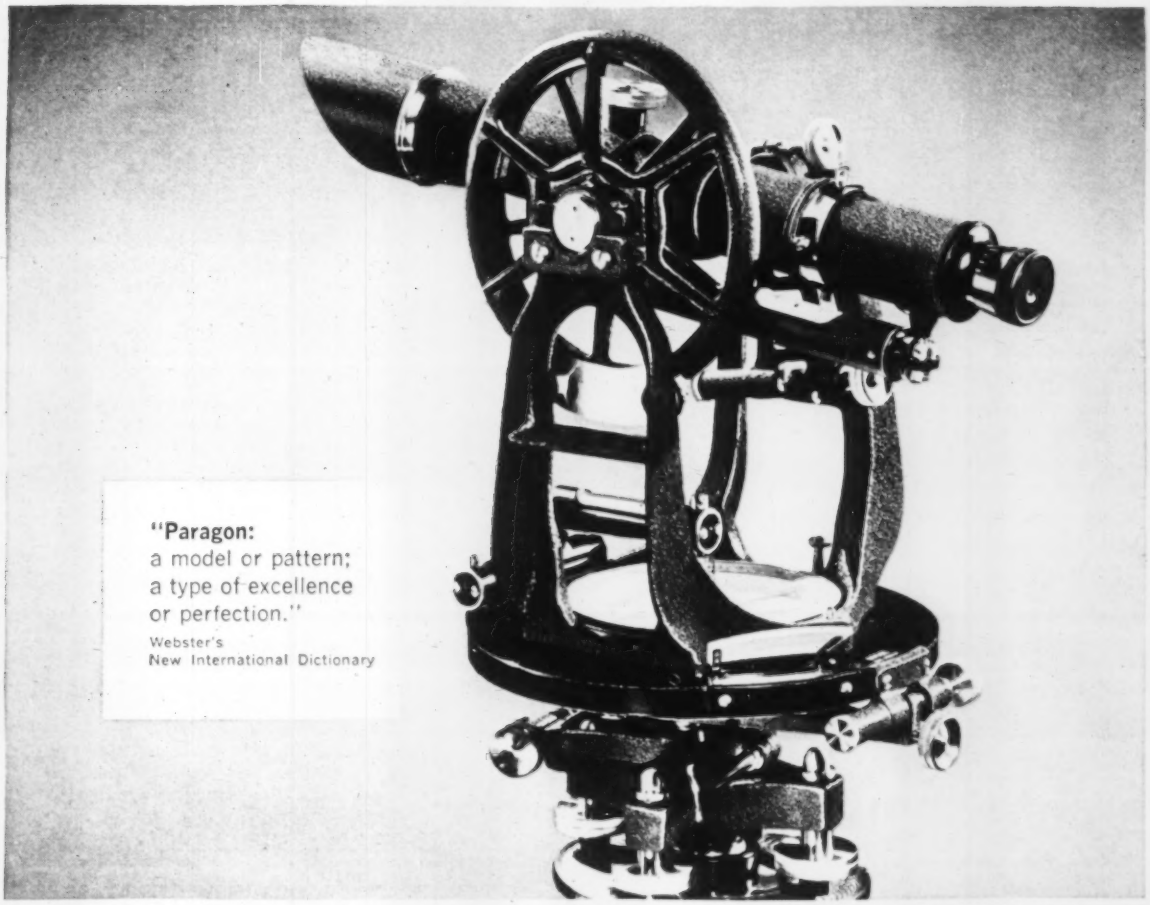
• **Plastic panels**—Structural Fiberglas-reinforced plastic panels are available with a special coating that increases panel weatherability, resistance to erosion and color stability. These panels are used primarily for industrial buildings, partitions, and skylights. Resolite Corp., Zelienople, Pa.

• **Modular duct system**—The Gatewayduct underfloor electrical-distribution system was designed with flexible components. The ducts come in standard 10-ft and 12-ft lengths with 2-ft c-c insert spacing. Both standard and super duct is available with supports and junction boxes easily interchangeable to handle either size raceway. Gateway Engineering Co., 3233 W. Grand Ave., Chicago 51, Ill.

• **Egg-shell roof**—An "egg-shell" steel plate roof with self-supporting arches provides a column-free, trussless area. The roof is made of prefabricated modular steel panels, which are fastened together with nuts and bolts. It can be supported at ground level or above ground on suitable framing and can be applied to any shape of curve or combination of shapes in a building structure. Shilagro Steel Products Corp., Somerville, Mass.

• **Abrasive cutters**—Five basic tools are being marketed that incorporate the use of crushed, sintered Tungsten Carbide under the trade name "TUNCO". They are a hand sander, wood rasp, contour rasp, abrasive saw and sanding disc. Both saws are adaptable for use with either power hand tools or conventional table stands. The tools are produced by permanently copper bonding "TUNCO" particles to steel in a hydrogen, atmosphere-brazing furnace under extremely high temperatures. Functional Products, Inc., 1460 East River Road, South, Aurora, Ill.

• **Shovel**—Two patented features strengthen a new type of D-handle shovel. An I-beam reinforcement takes



"Paragon:
a model or pattern;
a type of excellence
or perfection."
Webster's
New International Dictionary

In Transits too, K&E Paragon sets the pattern of perfection

The superior optical qualities and precision operation which K&E builds into the Paragon Transit® are designed to last a lifetime and offer the maximum in performance and ease of use. Compare the Paragon with other transits, feature by feature. Only the K&E Paragon Transit has all five of these important advantages:

1. A Completely Enclosed Achromatic Telescope . . . with an achromatic eyepiece *as well as* an achromatic objective lens. It sights clearly and sharply, with less eye strain. Enclosed telescope is fully sealed, stays free from dust and moisture.

2. Chrome Plated Draw Tube . . . with one of the hardest bearing surfaces known to man. Tube cannot wear as it moves back and forth on bearing rings, so line of sight remains stable.

3. Stainless Steel Axle Journals . . . for the best possible bearing surface. Ease of operation is retained no matter how many times you change the telescope from the direct to the reverse position.

4. One-Piece Spanned Vernier Disc . . . to make sure that the verniers always stay exactly 180 degrees apart. Even under the roughest, most demanding field conditions, angle readings of the Paragon Transit will stay true.

5. Chrome Plated Center . . . combines the toughness of non-brittle forged Everdur with the hardness of chrome.

Naturally, because the K&E Paragon Transit is the best, it costs a little more than ordinary transits. But see for yourself how much more it has to offer. A call to your K&E representative will quickly arrange for a demonstration. Fill out and send in the coupon below.

1612

KEUFFEL & ESSER CO. Dept. EN-12 Hoboken, N. J.

Gentlemen: ☐ Please have a K&E representative show me the K&E Paragon Transit.
☐ Please send me more information about the K&E Paragon Transit.

Name & Title _____

Company & Address _____

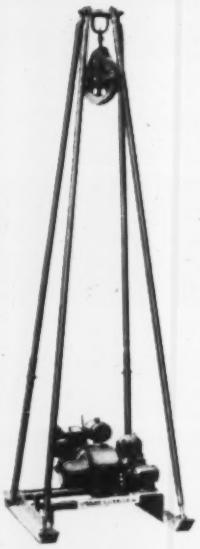
_____

YOUR FIRST NEED IN SOIL SAMPLING

AN

S&H PIPE DRIVING WINCH

INEXPENSIVE • LIGHTWEIGHT • ECONOMICAL



A Sprague & Henwood pipe driving winch is your first requisite for normal soil sampling operations. For shallow holes there is the Model PD, and for the deeper holes, the more rugged Model PDH. Both models are furnished with a tubular steel derrick with telescoping rear legs permitting 10' pulls. In addition to the skid mounting, there is also available a special trailer mounting that permits operation of the unit as either a skid or trailer-mounted unit. Write today for full particulars. Ask also for Bulletin # 300 which illustrates and describes the complete S & H soil sampling line.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc.

SCRANTON 2, PA.

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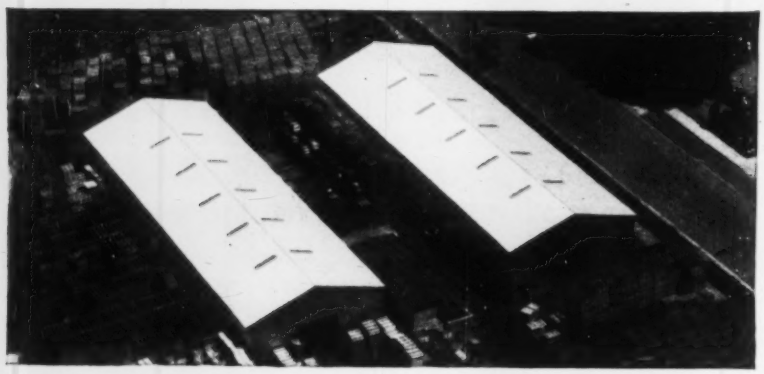

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excessive stress between handle and blade. The handle grip is locked in place with a steel retainer strip that fits flush in grooves across the handle top and locks in steel caps at either end. The Wood Shovel & Tool Co., Piqua, Ohio.

• **Soil anchor**—Ezy cast iron screw-type anchors weigh only 38 oz, are quickly placed and serve as tiedowns in any earth, says the manufacturer. Van Dyke Industries, 3625 Cahuenga Blvd., Los Angeles 28, Calif.

• **Vibrating precast screed**—Two new vibratory screeds, designed especially for finishing prestressed concrete, vibrate, compact and level at the same time. Models FSM-4 and 6. Thor Power Tool Co., 175 N. State St., Aurora, Ill.

• **Portable mixer**—Capacity of 9 cu ft and end-to-center mixing action are features of the 9-PM plaster-mortar terrazzo mixer. Kwik-Mix Co., 235 West Grand Ave., Port Washington, Wis.

• **Three-in-one nut driver**—Three spokes for driving No. 8, 10 and 12 nuts are welded together to form the "atom" pocket-size combination tool. Hunter Tool, P. O. Box 564, Whittier, Calif.

• **Concrete vibrator**—New design utilizes low-amplitude, high-frequency vibration with no-bearing, motor-in-head assembly. Pacific Mercury, 14052 Burbank Blvd., Van Nuys, Calif.

• **Trowelling machine**—A sliding sheave clutch, stationary guard ring and variable pitch adjustment are features of the new Model G34-4C Roto-Trowel. Stow Manufacturing Co., Binghamton, N. Y.

• **Hand fastening tool**—The T-25H single-piece fastening tool requires only a blow from a 2½-lb hammer to operate. The fasteners are rust-proofed and available in drive pins, threaded studs and drive ring fasteners in lengths up to 4 in. Hilti Rapids Fastening Systems, Inc., Dept. 62, 73 Southfield Ave., Stamford, Conn.

• **Tie clasp computer**—A slide-rule tie clasp in sterling silver or gold plate can be used for multiplying and dividing. It is fully and accurately calibrated with A, C and D scales, though only 2 in. long. The groove in which the C scale slides can be used for engraving a name. Price is $6.95 each, including postage. Monroe Merchandisers, 44½ East Ave., Rochester 4, N. Y.

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MACHINE	Shovel Capacity	AVAILABLE AS			
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43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

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Publications

Scraper—A 16-page, two-color catalog details the operating characteristics of International's "75" payscraper and its "55" payscraper. Catalog CR-733-H International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Prestressed concrete—"Single-Strand Tensioning for Prestressed Concrete" with description of a single-strand jacking unit. 4-page folder. Prestressed Equipment Co., Lakeland, Fla.

Compressors—Single stage centrifugal compressors for petrochemical and refinery applications are described. Two types, a low and a high pressure air service, are presented. Capacities range from 1,200 to 80,000 cfm. Input horsepowers vary between 10 and 2,500 bhp. Details are given on casing, bearings, seals, impellers, lubrication and couplings, plus recommended applications. Bulletin 165. Clark Bros. Co., Olean, N. Y.

Aluminum rails—"Aluminum for the Highway" illustrates and describes five advantages of aluminum alloy extrusions for bridge railings. These are cited as low cost, good appearance, noncorrosion, ease of fabrication erection and flexibility of design. 8-page brochure. Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.

Corrosion—New film on corrosion tells what causes anodes and cathodes to form on steel surfaces, how they produce electrolytic corrosion and what can be done about it. 19 minutes running time, 16mm color with sound. Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.

Films—20th edition catalog of motion pictures prepared and distributed by United States Steel Corp., U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.

Lift truck—Engineering, design and construction of the FT 20, 2,000-lb-capacity lift truck. 8-page bulletin BU 485. Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis.

Tracks—"A Caterpillar Speciality" discusses track shoes and hardware with information on selecting and rebuilding of track components. Charts show optimum time at which grousers should be built up. Torque specifications are listed for correct tightening of hardware. Tips on selection of track shoes for special applications. 8-page booklet Form DE 844. Caterpillar Tractor Co., Peoria, Ill.

(Publications continued p. 172)

4 in 1

3 in 1

2 in 1

GASOLINE ENGINE DRIVEN WELDER/POWER PLANTS

FIREBALL AMPERAGE RANGES	
METALLIC	INERT GAS
35-100 AC	35-75 AC
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35-80 DC	35-100 DC
75-175 DC	85-225 DC
125-350 DC	170-375 DC

DAH-350 FIREBALL four-in-one model is the only complete unit made to incorporate an ac-dc welder for (1) metallic arc, or (2) tungsten inert gas welding, plus (3) ac power plant, and (4) 1 KW dc power while welding. Twelve separate amperage ranges as shown above. Additional standard equipment features include a polarity switch, either continuous or "start only" high frequency and an automatic inert gas control panel with solenoid valve and postflow timer. Rated output at 100% duty cycle: 250 amps dc tungsten arc; 300 amps ac tungsten arc. Generator: 10 KW of 115/230v, single phase, 60 cycle ac.

DA-300 BIG RIG. Combination ac-dc welder, plus an ac power plant, plus 1 KW of dc power while welding, give this model three-in-one versatility. Generator rated at 10 KW of 115/230v, single phase, 60 cycle ac. Welding ranges in amperes are: (dc) 75-175 or 125-350; (ac) 65-160 or 110-400. Rated output at 100% duty cycle: 250 amps dc at 40 volts and 300 amps ac at 40 volts.

D-250 ROUSTABOUT provides a two-in-one arrangement whereby either of two dc welding current ranges — 75-175 amps or 125-350 amps — and 1 KW of 115v dc auxiliary power are available simultaneously. Rated output is 250 amps at 40 volts, 100% duty cycle. Generator produces 10 KW of 115/230v, single phase, 60 cycle ac.

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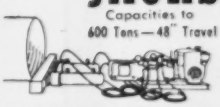

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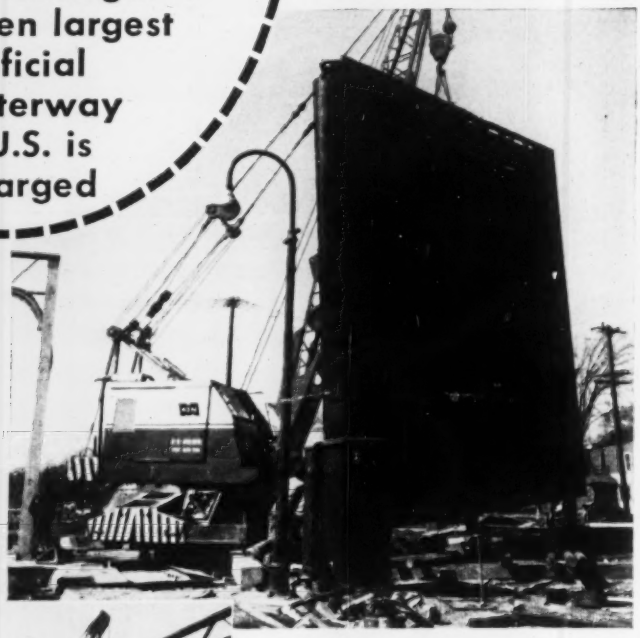
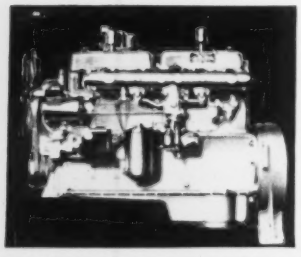


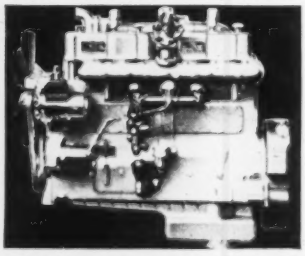
● To handle the huge gates for locks in the New York Barge Canal expansion project—R. D. Golden Co. used this Waukesha-powered 40-ton Marion type 43-M mobile truck crane. With its Waukesha engine powering the 40-ft. boom, at 64° and at a 22-ft. radius—the 30 x 45 x 2 ft., 32-ton gates were lifted with ease, swung and lowered into position. This mobile Marion unit is mounted on a Hendrickson Carrier powered by a Waukesha 145-GK Engine. The upper frame has a Waukesha 140-GK Engine and Twin Disc torque converter.

Powering Crane (boom)—140-GK Waukesha Gasoline, six cylinders, 4½-in. x 5½-in., 525 cu. in. displacement.



Send for Engine Bulletins 1548 1551

Powering the Carrier—145-GK Waukesha Gasoline, six cylinders, 5¼-in. x 6-in., 779 cu. in. displacement.



412

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

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Factories—Waukesha, Wisconsin, and Clinton, Iowa

. . . Publications

Drilling tools—Illustrations and specifications on carbide drill bits, drill rods and air tool accessories. Instructions included for sharpening and hardening moil points, digging chisels and other cutters. 24-page catalog 358. BRUNNER & LAY, INC., 9300 KING ST., FRANKLIN PARK, ILL.

Wheel tractors—Features and specifications for wheel tractors in six power sizes from 12 hp to 72.5 hp. 16-page catalog CR137-4H. INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Farm ponds—Explanation of the use of farm ponds, the conditions governing their location and the major considerations in their construction. 8-page Form D846. CATERPILLAR TRACTOR CO., PEORIA, ILL.

Airport concreting—Discussion of problems encountered in concreting airport pavements and structures. 20-pages. MASTER BUILDERS CO., 7016 EUCLID AVE., CLEVELAND 3, OHIO.

Safety lights—Complete specifications of uni-directional lights and high intensity neon flashes and descriptions of wood and steel barricades. Bulletin LL-6807. R. D. FAGEOL CO., KENT, OHIO.

Ice control spreader—Literature on a skid-mounted ice control spreader that can be moved from storage to action in 15 minutes. HIGHWAY EQUIPMENT CO., DEPT. H24-1, 616 D AVE., N.W., CEDAR RAPIDS, IOWA.

Concrete piers—A 16-mm film about the construction of concrete piers for the Mackinac Bridge is now available. ADVERTISING DEPT., INTRUSION-PREPAKT, 568 UNION COMMERCE BUILDING, CLEVELAND, OHIO.

Straddle carrier—Description of specifications, construction features and operating characteristics of a straddle carrier. 4-page brochure. INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT CO., BATTLE CREEK, MICH.

Rear dump—The Model R-27 rear dump hauler for heavy construction is described. Specifications included. 16-page catalog. EUCLID DIV., GENERAL MOTORS CORP., CLEVELAND 17, OHIO.

Panel forms—New principle in plywood panel form design together with basic erection details, and methods of simplified concrete forming, illustrated in 8-page bulletin No. AP-59. SUPERIOR CONCRETE ACCESSORIES, INC., 9301 KING ST., FRANKLIN PARK, ILL.

Mr. Randall Kilmer uses the Blaw-Knox Black Top Paver on the Elwha River Road west of Port Angeles. He values the locking differential that keeps the Black Top Paver going under all kinds of traction conditions.

"A REMARKABLE PAVER"

"It's maneuverability has already saved us the cost of an additional machine for dual lane paving. We've used the Blaw-Knox Black Top Paver just about everywhere—parking lots—widening and relocating—section repairing. Transportation costs for an ordinary paver would have made it unprofitable for us to bid jobs like these," reports Randall Kilmer, owner of the Kilmer Construction Company, Port Angeles, Washington.

"We have been able to bid on a wider variety of work and the quality of the mat layed by this machine is first and foremost with us. A State Highway Department Engineer rates it as one of the best he's ever seen," Mr. Kilmer reports.

Downtime on Mr. Kilmer's Blaw-Knox Black Top Paver has been limited to one on-the-spot fifteen minute repair job in a year. Routine greasing takes approximately thirty minutes per day.

Profitable, trouble-free performance like this has made the Blaw-Knox Black Top Paver a real money maker for contractors all over America. Why not get the full story from your Blaw-Knox distributor —you'll be surprised at how quickly you'll start earning additional profits.

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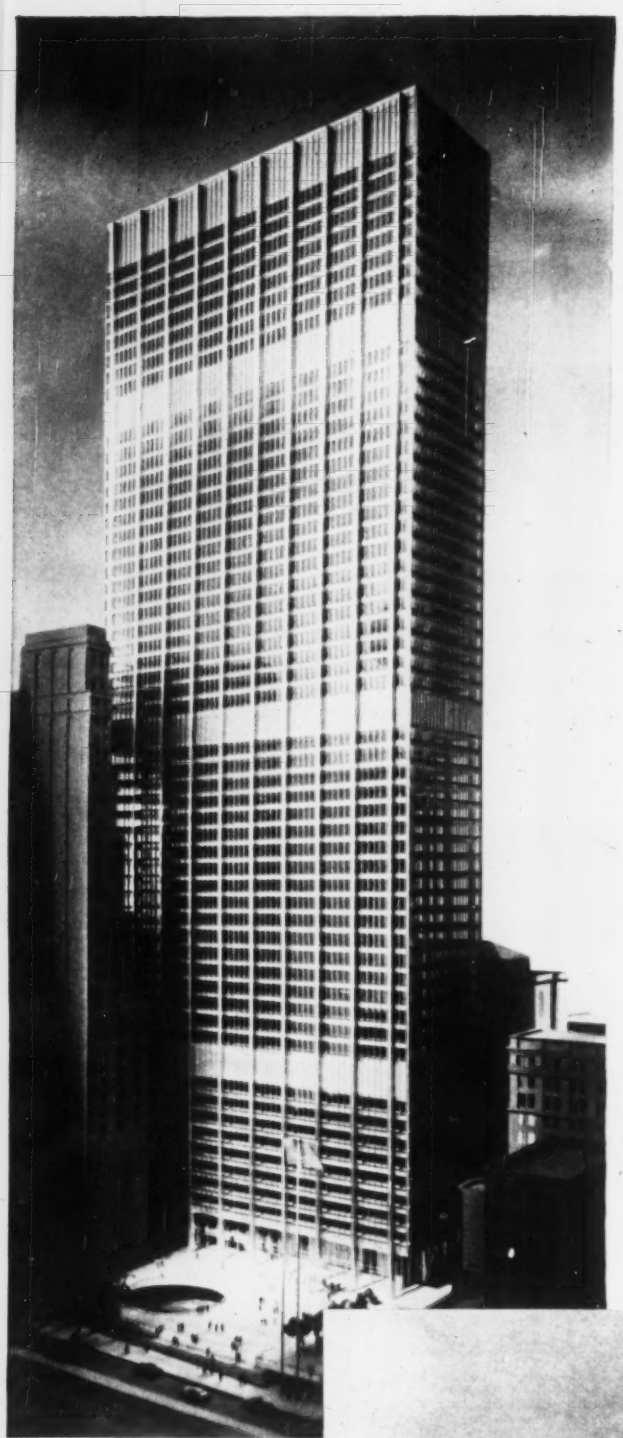

Chase Manhattan Building, to be completed in New York in 1960. Architects: Skidmore, Owings & Merrill. General Contractors: Turner Construction Co. Structural Engineers: Weiskopf & Pickworth. Authorized SPRAYED "LIMPET" ASBESTOS applicator: E. B. Carley & Co., Inc.

Fast one-stop application. SPRAYED "LIMPET" ASBESTOS combines in mid-air with water from special spray gun. No mess, no dangerous solvents, no difficult clean-up afterwards.

CHASE MANHATTAN BUILDING GETS MODERN FIRE-PROTECTION WITH SPRAYED "LIMPET" ASBESTOS

while other work continues without interruption

The 60-story Chase Manhattan Building in New York is being protected from fire by a half-inch minimum coating of SPRAYED "LIMPET" ASBESTOS under Robertson cellular steel flooring. The largest job of its kind in history, this application will receive a UL fire-retardancy rating of four hours.

Your crews work faster around the application of this modern sprayed-on insulation. Here's why:

Applying SPRAYED "LIMPET" ASBESTOS to structural members and to the undersides of cellular steel floors is an efficient operation with scaffolding moving ahead as the applicator completes his work. Other work is not held up with such one-stop action.

No flammable, toxic solvents with SPRAYED "LIMPET" ASBESTOS, just clean water and 100% asbestos fiber with an inorganic, dry binder. No hazard in welding or acetylene cutting nearby. No need for open windows. No danger in smoking.

Skilled authorized applicators with special equipment do the job fast, keep out of your way.

These advantages, plus the inherent simplicity of SPRAYED "LIMPET" ASBESTOS, add up to lower installed costs for superior fire-protection. More and more engineers and contractors are recognizing the advisability of insulating against fire damage, fuel losses, condensation, and acoustical disturbances with a simple one-layer application of SPRAYED "LIMPET" ASBESTOS.

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Highway Officials

Michigan names three to newly created jobs

Three new executive office positions have been created for the top ranks of the Michigan State Highway Department—Managing Director of the Department, directly under the State Highway Commissioner, Administrative Director, and Director of Engineering.

Howard E. Hill, formerly engineering deputy for the commissioner, has been named Managing Director. He will be second in command to Commissioner John C. Mackie. Mr. Hill, 52, is a 1931 graduate of the Michigan College of Mining & Technology. Among his previous jobs are engineering positions with automobile companies and Corps of Engineers.

Fred E. Tripp, 36, was appointed Administrative Director. He was executive assistant to the commissioner. Mr. Tripp holds a degree in public administration from Michigan State.

Engineering Director—John E. Meyer

John E. Meyer, 54, until recently director of route location, is the first Director of Engineering. He is a graduate of the Michigan College of Mining & Technology.

Hydrology Expert Retires From Post

H. Banks Kinnison, U. S. Geological Survey's surface-water branch area chief for the western states, has retired after more than 40 years of federal service. Mr. Kinnison has been headquartered since 1956 in Menlo Park, Calif. Previously he was district engineer in Boston.

His work in Boston included measurement of surface-water supply of the area, including gaging of rivers in Massachusetts, Rhode Island, New Hampshire and Vermont.

Mr. Kinnison graduated with a civil engineering degree from the University of Idaho in 1914. Before joining USGS in 1918, he served as deputy county engineer for Bonner County, Idaho, and for three years was chief of party of the Colony Holding Corp., Atascadero, Calif.

He served as the president of the Eastern Snow Conference in 1946 and the Boston Society of Civil Engineers in 1947.

Civil Engineers Affiliate With Stanford Program

The engineering office of Clyde C. Kennedy, San Francisco, has become the first civil engineering firm to affiliate with Stanford University's Honors Cooperative Program. James T. Pott, civil engineer with the Kennedy firm, has been selected as its first participant.

Under the program engineers are sent by their firms to Stanford on a part-time basis to work for advanced degrees or study in specialized fields.

To make such a part-time program feasible for the university to administer, the firms provide added financial support and agree to participate in the program for a definite period.

Mr. Pott received both his Bachelors and Masters degrees from Stanford University. He served as an officer in the U. S. Army Corps of Engineers during World War II and the Korean War. Since joining the Kennedy firm in 1950 he has had varied experience in construction supervision, investigation and design. His most recent assignment was as hydrologic specialist on water resources planning for Formosa under a contract with the Republic of China.

W. R. Froelich Appointed To Pennsylvania Road Job

William R. Froelich, executive director of the Public Parking Authority of Pittsburgh since 1952, has been appointed chief deputy secretary of the Pennsylvania Department of Highways by Gov. David L. Lawrence.

Mr. Froelich received a bachelor of science degree in civil engineering from Carnegie Institute of Technology and a master of science degree in city planning from Massachusetts Institute of Technology. He served in the Army Corps of Engineers during World War II and rose to lieutenant-colonel.

He was president of the Pittsburgh section of the American Society of Civil Engineers in 1957. He is a member of the Institute of Traffic Engineers, the National Society of Professional Engineers and the American Society of Planning Officials.

Robert A. Farley, chief engineer of the department, will transfer to the Pennsylvania Turnpike Commission as chief engineer.

Department of Highway promotions are: Harold W. Reitz, to acting district engineer in charge of District 3, and Arthur Victor Cesare, to acting district engineer in charge of District 5.

(Turn the page)

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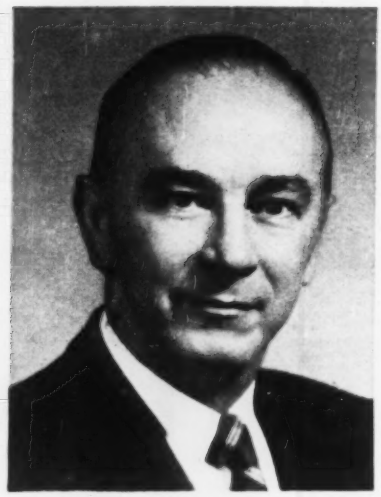


Merritt-Chapman Names Harvey New President

Robert E. Harvey has been elected president of Merritt-Chapman & Scott Corp. He previously was senior executive vice president.

Mr. Harvey was advanced to the new post in accordance with plans announced two years ago by Louis E. Wolfson, board chairman of Merritt-Chapman, to separate the dual posts held by Mr. Wolfson as both chairman and president.

As president Mr. Harvey will assume operational responsibility for Merritt's activities. Mr. Wolfson will continue as chief executive officer.

Mr. Harvey joined MC&S in 1954. He has served since 1956 as senior executive vice president and a member of the company's executive committee.

Former Nebraska Official Enters Consulting Firm

L. N. Ress, Nebraska's state engineer from 1953 until early 1959, has joined the consulting engineering firm of Kirkham, Michael & Associates, of Omaha, Neb.; Oklahoma City, Okla.; Fargo, N. D., and Rapid City, S. D.

Mr. Ress will enter the firm as an associate and chief highway engineer.

A native Nebraskan, he worked in the state's highway department since 1919, when he was attending the University of Nebraska's College of Engineering. This service was broken only by three years with the Illinois State Highway Department.

Mr. Ress is a former president of the Mississippi Valley Conference of State Highway Departments and a past regional vice president of the American Association of State Highway Officials.

N.Y.C. Consultants Elect Hennessy; Protest Fees

John F. Hennessy, Jr., vice president of Syska & Hennessy, mechanical and electrical engineers, was elected president of the New York Association of Consulting Engineers at its 34th annual meeting.

Vice presidents elected are Richard T. Baum of Jaros, Baum and Bolles, and Sigmund Roos, head of his own firm. Joseph L. Fraioli, of Fraioli-Blum-Yesselman, was elected treasurer and Samuel A. Bogen, head of his own company, was re-elected secretary.

The association passed a resolution urging New York City to adopt a fee formula based on an amount equal to two and one-half times the net time-card costs of the design staff engaged on the work. "This formula is a well established one, is widely used in our private practice and has found a fairly general acceptance all over the country," the resolution says.

NYACE represents several leading mechanical, electrical and structural engineers in New York City. Its members are responsible for the engineering design of many major buildings constructed in the city.

Houghton Hallock Joins Consulting Engineer Firm

H. R. Hallock, retired U. S. Army Engineer colonel, has joined Gannett Fleming, Corddry and Carpenter, Inc., Harrisburg, Pa., as director of the firm's general engineering division.

Colonel Hallock served with the Corps in Europe, Greenland, Hawaii, Okinawa, the Los Angeles District and as district engineer at Fort Worth, Tex. His work has been in design and construction of dams, floodways, airfields and military and civil works projects.

After retiring in 1957, he became director of research for Texas Electric Service Co. and executive vice president of the Texas Atomic Energy Research Foundation.

Col. Woodrow Wilson To Head Detroit District

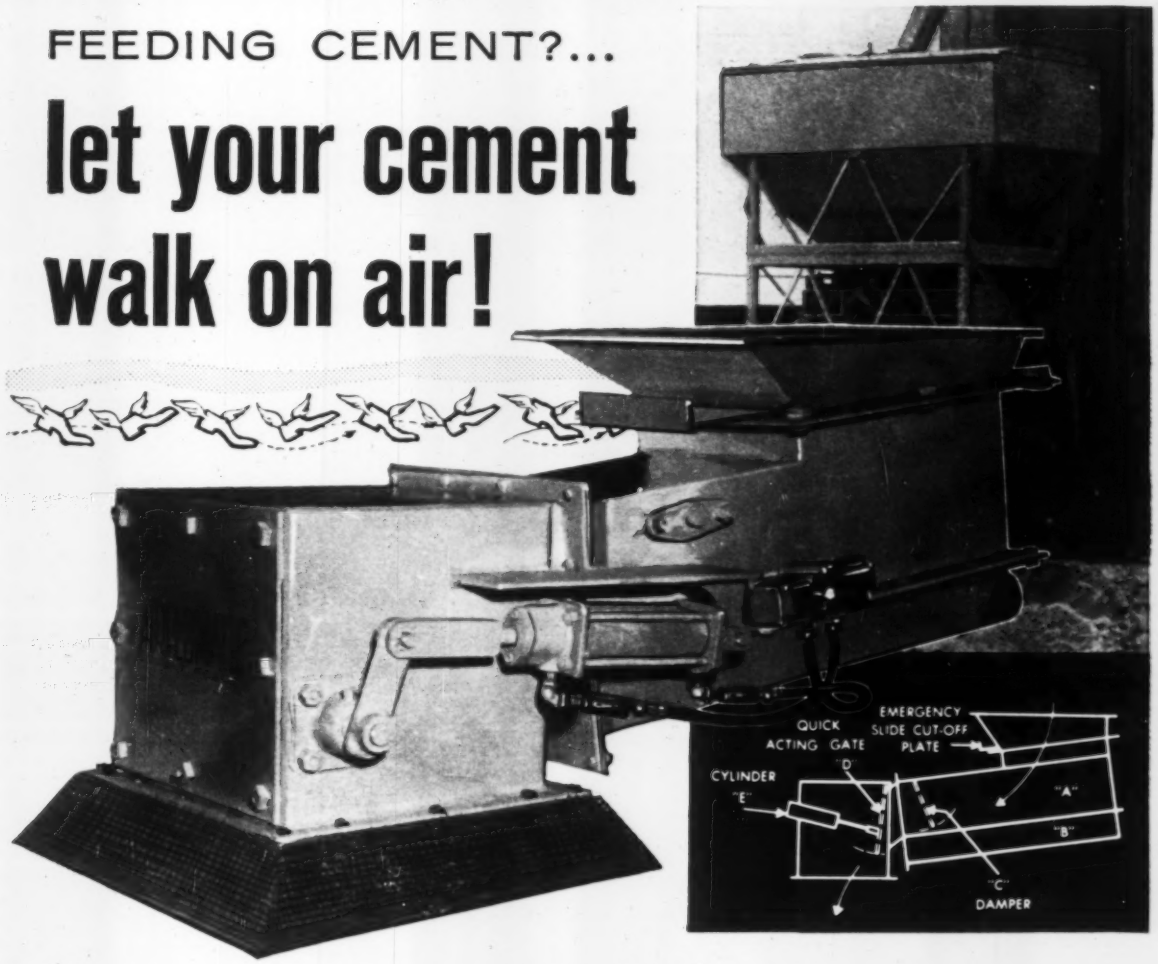
Col. Woodrow W. Wilson will become district engineer of the Corps of Engineers' Detroit District in July. He succeeds Col. Peter C. Hyzer.

Colonel Wilson was executive officer in the Louisville, Ky., district from 1948 to 1950. Later he was executive officer in the Ohio River Division at Cincinnati. He is now with the 7th Army in Europe.

(Men and Jobs continued p. 178)

FEEDING CEMENT?...

let your cement walk on air!



The BUTLER Airflomatic Cement Feeder

With the BUTLER AIRFLOMATIC your cement is conveyed on a trouble-free cushion of air. No moving parts to break. Nothing to cause down-time because of feeder trouble.

And you have high precision feeding—always.

Best of all, the BUTLER AIRFLOMATIC can easily be installed in any plant regardless of make wherever a vane feeder or screw feeder has been used.

A blower attached to the batcher platform provides a cushion of large volume, low pressure air which also aerates and fluffs the cement in the overhead bin . . . and does it much more effectively than a costly compressor. Often no jets for additional air are needed.

So no matter who manufactured the plant you have, call in the BUTLER Distributor* for a complete description of the Airflomatic Feeder or send the coupon directly to BUTLER BIN. You'll get prompt action.

BUTLER BIN COMPANY
947 Blackstone Avenue, Waukesha, Wisconsin

*One BUTLER Distributor put an Airflomatic in his pick-up truck, called at 20 Concrete Plants and Roadbuilders set-ups. All 20 bought Airflomatics. You'll want it, too.

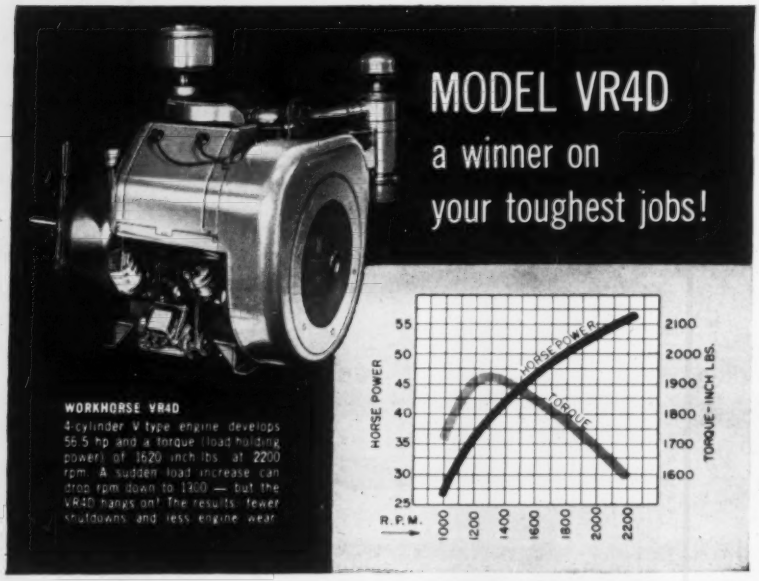
BUTLER BIN COMPANY, Waukesha, Wisconsin

Please send me complete description and costs of the BUTLER AIRFLOMATIC CEMENT FEEDER

- ☐ We have a Ready-Mixed Plant which was manufactured by .....
- ☐ Highway Batching Plant which was manufactured by .....
- ☐ Concrete Block Plant which was manufactured by .....

NAME .....
COMPANY .....
STREET .....
CITY ..... STATE .....

this WISCONSIN engine is a **Workhorse...** not a race horse!



Here's 56.5 hard-working horsepower you can depend on for steady power at any pace! The Model VR4D breezes through normal power demands — works effortlessly at top speed. But most important, it has rugged load-holding power at slow speeds — to keep going under sudden shock loads that would most likely stall other engines with the same piston displacement.

You don't have to pamper the Model VR4D. It's built to resist the hardest shocks on the toughest construction jobs. Air cooling cuts engine weight and upkeep—assures fast starts and top efficiency in any weather, from sub-zero to 140°F. Stellite exhaust valves and valve seat inserts and positive-type valve rotators extend valve life by 200% to 500%. They resist corrosion and pitting—give better fuel economy.

Protect yourself — specify Wisconsin-powered equipment for the tough jobs ahead. You get workhorse stamina in *every* Wisconsin engine—single-, two-, or V-type four-cylinder models, from 3 to 56 hp. Write for Form S-230 on the VR-4D — or Bulletin S-237 describing the entire Wisconsin line.

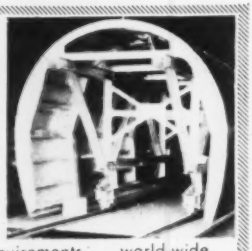
WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

A9-8258

ABILITY

SACHSE ELECTRIC INC.
BATON ROUGE LA.

STEEL FORMS



For tunnel, sewer or conduit . . . all types of steel forms designed and built to exacting requirements . . . world-wide. Send for Bulletin No. 22 today.

MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

. . . Men and Jobs

Ohio Highways Department Gets New Executive Team

Everett S. Preston, Ohio's new director of the Department of Highways, has completed the appointment of his executive team.

His five new deputy directors are: James T. Welsh, administration; Guy E. Neeper, planning and programming; C. W. McGaughey, design and construction; Samuel O. Linzell, operations; and Lowell F. Schaublin, right-of-way.

G. A. Berry, a veteran highway department engineer and, more recently, engineering counsel for the Ohio Automobile Association, was named first assistant director, at $16,000 a year.

Mr. Preston chose Robert E. Wallace as his executive assistant and Arthur D. McIntire as director of the department's public relations.

Other appointments made by the director of highways are: Edward Ellis, chief engineer of construction of the division of design and construction; James F. Roose, chief of Division 1; William J. Gross, in charge of Division 2; Paul Kostyshak, deputy director of Division 4; Carl L. Campbell, urban project engineer of Division 4; T. Dye Barnhouse, deputy director of Division 5; Joseph M. Unger, deputy director of Division 8; and O. Carson Barklow, engineer of Division 9.

New Highway Engineer Asked to Reorganize

Edward L. Pine recently assumed the duties of state highway engineer for Nevada. He replaces Huston Mills, who resigned.

In his $15,000-plus job, Mr. Pine will have charge of administering a $41-million budget. He has been asked by the state highway board to reorganize the highway department.

Mr. Pine, 44, is a graduate of the college of engineering of the University of Nevada.

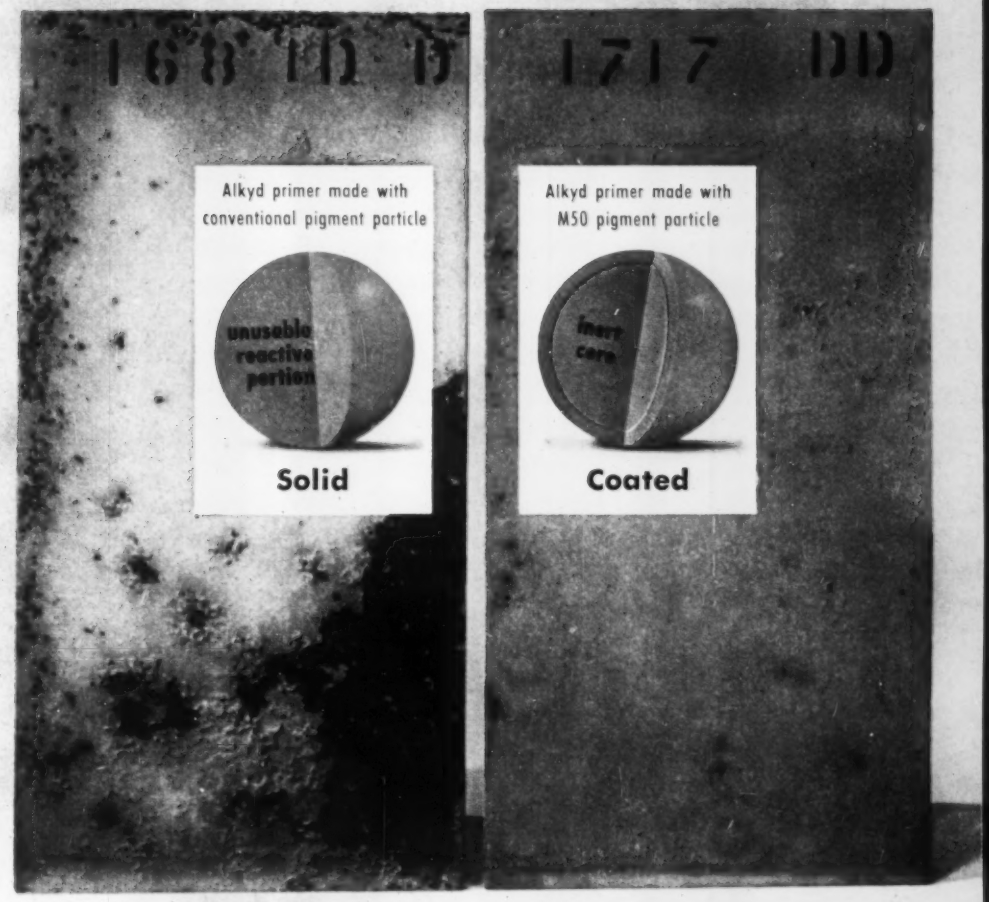
Roadbuilding School Draws Large Body of 'Students'

A bituminous concrete plant mix school, the first ever held, attracted over 300 engineers, contractors, machine suppliers and public agency representatives to North Carolina State College, Raleigh, N. C., last month.

Aim was to teach how to build better streets and highways at less cost. Practical paving demonstrations were supplemented with panels, films, discussion periods and lectures. The school will become an annual affair.

(*Men and Jobs continued p. 181*)

Never before such durable metal protection



Proof M50 pigment Defense in Depth paints deliver up to 300% greater content of rust-inhibitive ingredient

Exposure tests make it plain! Paints containing M50* basic lead silico chromate pigment do more to prevent rust. Look at the panels above. These primers were applied (2.0 mils, dry) over rust and mill scale (to intensify severity of the tests), then exposed 12 months at Perth Amboy, N. J. in an industrial atmosphere and 12 months at Sayville, L. I. in a normal atmosphere at 45° South. Clearly, the rust arresting action of M50 pigment is significant.

Research analysis of tests like this prove an *M50* pigment Defense in Depth paint provides substantially more rust-inhibitive action than comparable paints made with conventional pigments. You can see one reason for this. The configuration of the *M50* pigment particle provides a more efficient way to take advantage of the well-known rust-inhibitive properties of the active ingredients (fused lead chromate).

Second reason for the improved anti-corrosive action of *M50* Defense in Depth paint systems is the versatility of the *M50* pigment. Unlike other rust inhibitors, the inert-core particle is technically desirable and economically practical for use in intermediates and finishes . . . not just in primers alone. *Each* coat in an *M50* pigment system can be given substantial rust-inhibitive properties in its own right. Hence total rust-inhibitive pigment content of some *M50* pigment systems exceeds the rust-inhibitive content of comparable non-*M50* pigment systems by as much as 300%.

See on the next page other ways *M50* pigment Defense in Depth paints step up metal protection. See also how National Lead is prepared to help you get these superior specification products from your regular paint suppliers.

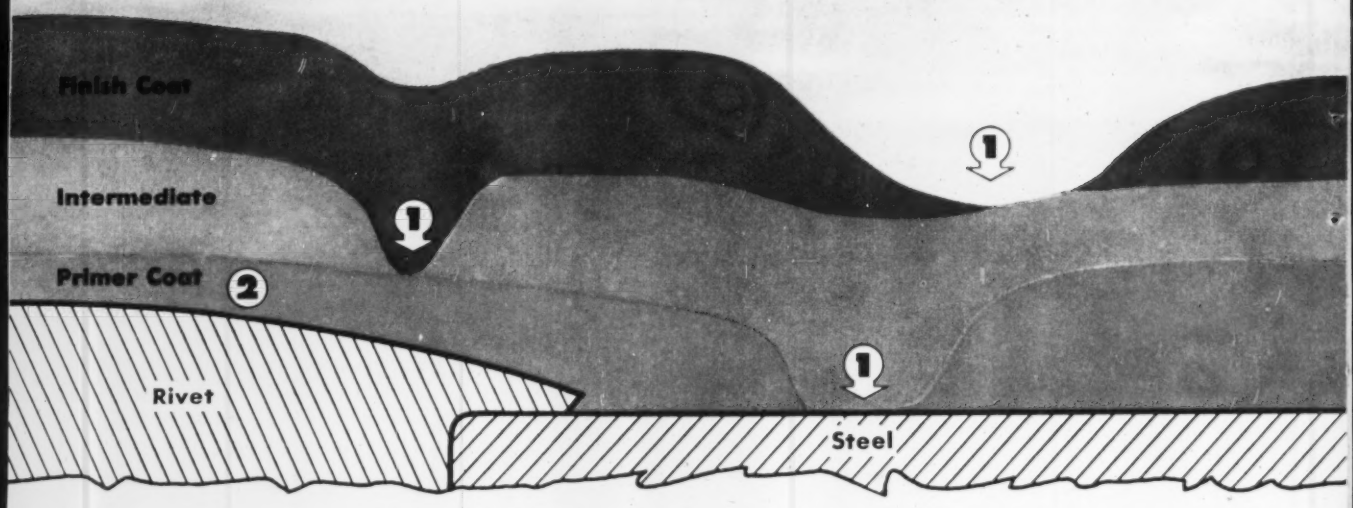
*Registered trademark of **National Lead Company**

General Offices:
111 Broadway, New York 6, N.Y.

For more facts, turn page

(1) "Holidays" in any coat of M50 pigment systems are less harmful . . . all coats provide **both** rust inhibition and weather resistance.

(2) With M50 pigment Defense in Depth paints, thin deposit areas such as rivet heads, have more protection . . . paints "wet" pits and hollows, too.



Schematic section through 3-coat M50 pigment Defense in Depth system shows new paints provide two performance extras

Information on the preceding page proves that *M50** pigment Defense in Depth paints deliver inherent rust inhibition well beyond that available in other anti-corrosive paint systems.

Diagram above shows two additional performance extras. Because *M50* pigment coats give more protection over thin deposit areas . . . because breaks in *M50* pigment coats traceable to damage or painting mishaps are less harmful . . . the need for on-the-job spot priming and touch-up is greatly reduced. Then, too, *M50* pigment primer coats are not only rust inhibitive but also weather resistant. Re-priming is rarely needed.

Other advantages of *M50* pigment paints include a broad choice of colors in all coats, with excellent tint retention.

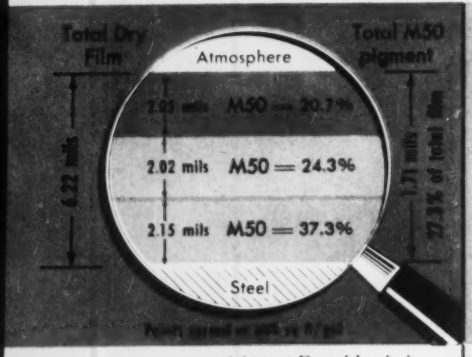
Are you responsible for steel structure maintenance?

If so, you are invited to examine exposure tests of *M50* pigment paints at National Lead's Sayville, L. I. test station. National Lead will also: – (1) send you a 24-page descriptive brochure, "Defense in Depth." (Mail coupon below); (2) provide technical aid in test applications; (3) help you develop suitable specifications for paints containing *M50* pigment.

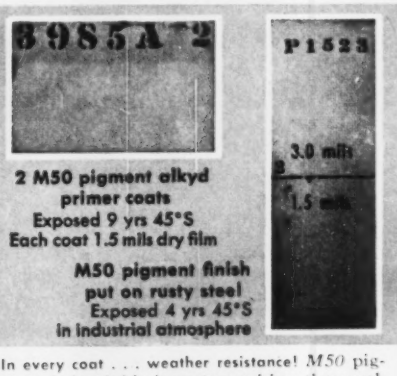
For M50 pigment paints themselves, contact your regular suppliers.

*National Lead Company trademark for a basic lead silico chromate pigment

Why M50 Defense in Depth paints give you metal protection beyond all former concepts



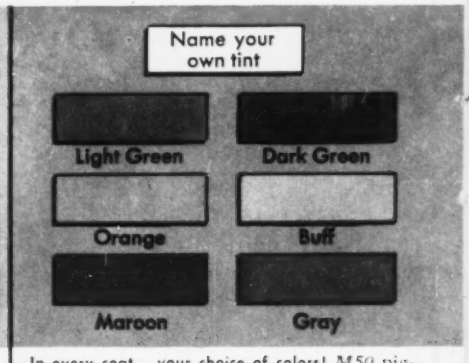
In every coat . . . rust inhibition! Fused lead chromate is noted for rust-inhibition. The *M50* pigment particle structure permits paint makers to include large proportions of lead chromate in all coats of anti-corrosive systems.



2 M50 pigment alkyd primer coats
Exposed 9 yrs 45°S
Each coat 1.5 mils dry film

M50 pigment finish put on rusty steel
Exposed 4 yrs 45°S
in industrial atmosphere

In every coat . . . weather resistance! *M50* pigment is insoluble in water and has the excellent tint retention properties of fused lead chromate. Unlike other rust inhibitors, it actually boosts weather resistance of paints.



In every coat . . . your choice of colors! *M50* pigment gets along well with most tinting pigments, permits paint makers a wide range of colors . . . not only in intermediates and finishes but in primer coats as well. Colors stay true.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me your 24-page brochure, "Defense in Depth." Include color card of the six *M50* pigment paints you recommend for steel highway structures.

Name _____ Title _____

Firm or Dept _____

Address _____

City _____ State _____

Army Engineers to Set Up Eight New Alaska Offices

To supervise defense and civil works construction in the newest state, the Corps of Engineers will establish new resident offices at Anchorage, Fairbanks, Juneau, Nome, Fort Greely, Clear, Shemya and Western Alaska.

The new offices will take over and centralize control of construction field supervision. Under the reorganization of district field forces, eight resident engineer and project engineer offices will be deactivated. Construction work formerly under the supervision of these offices will now come under project engineers operating out of the new offices.

Colonel S. G. Reiff to Go To Southwestern Division

Col. Stanley G. Reiff will shift from the Office of the Chief of Engineers in Washington to the Southwestern Division in Dallas as deputy division engineer in May. He will succeed Col. Robert L. Mushen.

Colonel Reiff served as acting chief of engineers for civil works for several months last year. He has been executive officer of civil works since November, 1956. During the preceding eleven months he served as chief of the Technical Liaison Division which handles the Corps' public information activities.

He served as District Engineer in Tulsa from 1953 to 1956.

Top Jobs Are Filled In Tennessee Highways

Tennessee highway commissioner D. W. Moulton has promoted state construction engineer H. D. Long to state highway engineer. As No. 2 man, Mr. Long, 59, will be responsible for activities of the entire department.

Other appointments made are: Herbert K. Bates—from state highway engineer and acting commissioner to chief urban engineer; Leon T. Cantrell—from state locating engineer to chief rural engineer; Warner Dunlap—from Mr. Long's assistant to state construction engineer; Howard E. Anderson—from press secretary for retiring Gov. Frank Clement to director of public relations.

Koebig and Koebig Names Shelton as Chief Engineer

M. J. Shelton has joined Koebig and Koebig, engineering-architecture-consulting firm, Los Angeles, as chief engineer of the San Diego office.

Mr. Shelton has been active in water development for over 25 years and held such positions as deputy director of

Cut job costs with reliable

KOHLER ELECTRIC PLANTS

Kohler electric plants are specified for new turnpike and other major construction jobs—where efficiency calls for smooth, quick-starting power of proved reliability. Air-cooled, 4-cycle models for lights, power tools . . . Emergency plants for turnpike toll plazas, maintenance buildings. Sizes to 100 KW, gasoline and diesel. Write for folder E-1.

Model 1.5M25, *1500 watts, 115 volt AC. Manual start; 2500 watt AC models available.*

KOHLER CO., KOHLER, WIS.
Established 1873

KOHLER OF KOHLER

Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings
Electric Plants • Air-cooled Engines • Precision Controls

JOHNSTON VERTICAL *PROPELLER* PUMPS

- Pumps to 100,000 gpm.
- Always primed
- Heaviest construction
- Takes small space

FOR: water supply, municipal raw water stations, dewatering, general industrial use.

PUMPS LIQUIDS FROM: rivers, lakes, ditches, canals, sumps, shipholds, dams.

Write for colorful bulletin.

JOHNSTON PUMP COMPANY
A Division of the Youngstown Sheet and Tube Company
PASADENA, CALIF.

JOHNSTON PUMP CO.
BIN K, PASADENA, CALIF.
Send complete information on Propeller Pumps.
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ADDRESS_____
FIRM_____

2*

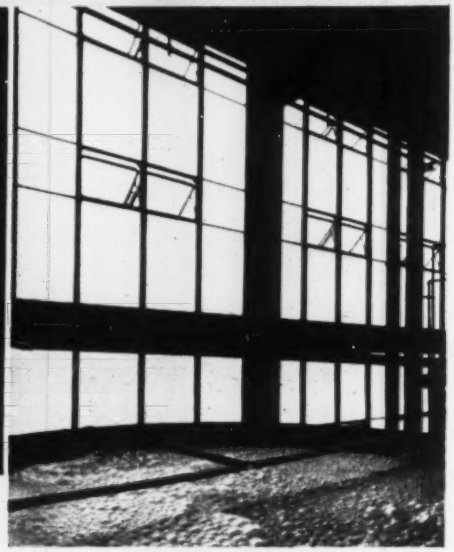
DAYLIGHTING DO's and DON'Ts

FOR COMFORT-CONSCIOUS ENGINEERS

* No. 2 of a series to help Engineers increase plant efficiency and economy.

DON'T expect to eliminate the harmful effects of "raw" sunlight through ordinary glass.

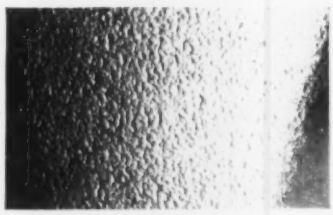
Today, most engineers realize the importance of proper factory lighting to boost efficiency and employee morale. Excess solar heat makes interiors uncomfortable . . . and blinding glare makes seeing tasks difficult and tiring.

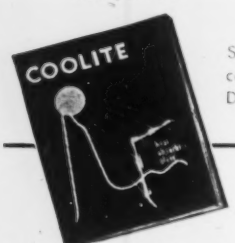


DO INSIST ON **COOLITE,** HEAT ABSORBING GLASS

Blue-green Coolite, glare reduced, controls the quality of light flooding work areas, helps banish objectionable glare . . . cuts costly eye fatigue that results in seeing errors and reduces solar heat up to 50%! That's quite an order but Coolite can do all this because Coolite filters out the unwanted factors in raw sunlight to help keep interiors cooler, brighter, more comfortable.

Buy, specify, insist on Coolite Glass. Available wired and unwired at better distributors of quality glass everywhere.





Send for Coolite catalog. Address Department 20.

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NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

California Department of Water Resources, general manager and chief engineer of the Helix Irrigation Districts, director and secretary of the San Diego County Water Authority and member of the San Diego Regional Water Pollution Control Board and later the State Water Pollution Control Board.

He has served as a National Director of the American Society of Civil Engineers and as chairman of the California Section, American Water Works Association.

Careers

Government

Col. Robert P. Young, assistant district engineer of the U. S. Army Engineers at Seattle, will become district engineer in July to succeed Col. Reginald J. B. Page, who will be assigned to the National War College, Washington, D. C.

Col. Marvin L. Jacobs of the Joint Staff in Hawaii, will become district engineer at Memphis in August. He will succeed Col. William P. Jones, Jr., who will attend the Army War College, Carlisle Barracks, Pa.

Col. Earle B. Butler, assistant district engineer at Buffalo, N. Y., will become district engineer this spring. He will succeed Col. Loren W. Olmstead, who will be assigned to the Office of the Army Chief of Engineers, Washington.

Lt. Col. W. K. Shaffer, for the past two years Deputy District Engineer, Corps of Engineers, Wilmington, N. C., has been transferred to Korea to assume command of an engineer battalion of the Eighth Army. He formerly served in the Jacksonville, Fla., District as area engineer for construction at the Homestead Air Force Base.

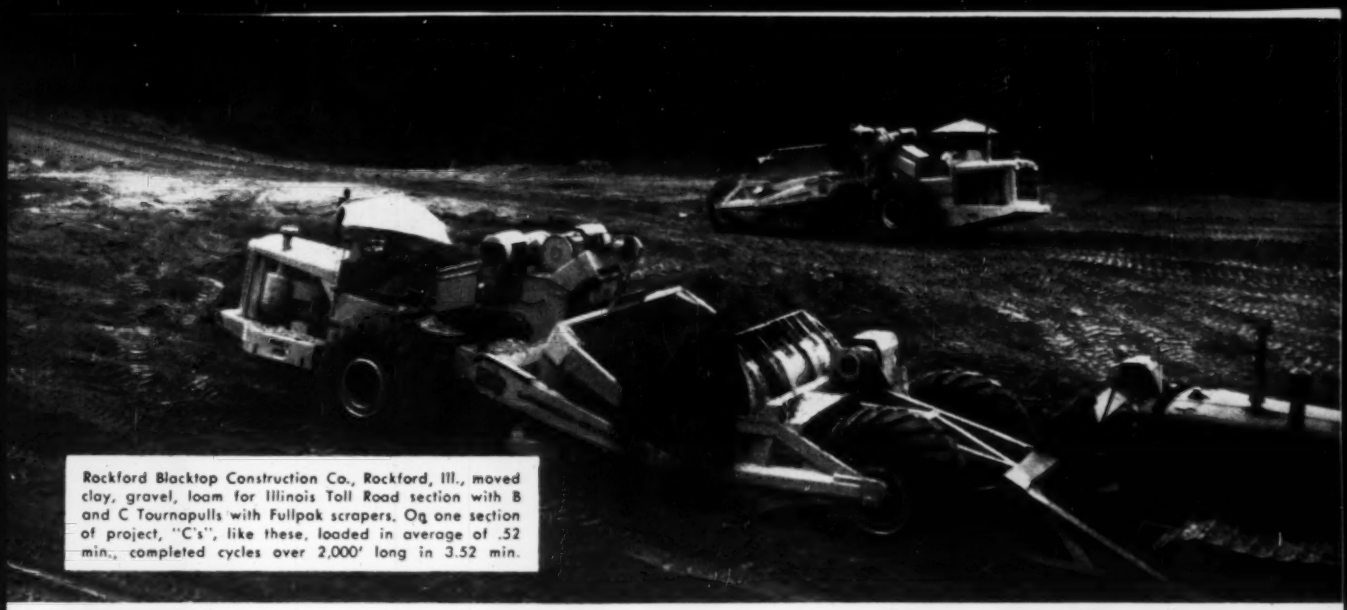
Retirements

William L. Sapper, a director in the Engineering & Construction Division of the Pittsburgh Naval Reactors Operations Office, U.S. Atomic Energy Commission, has retired. Mr. Sapper has been with the AEC since its c. ly Manhattan Engineer District days and previously with the Corps of Engineers.

R. R. Brookshire, with AEC's Oak Ridge Operations Office since 1952, has been named head of the E&C division. Both men previously served with the U. S. Army Corps of Engineers for about 10 years.

Jack Johnson has retired as secretary of R. E. Clarson, Inc., St. Petersburg, Fla., construction company. He is succeeded by R. F. Gilbert, former job manager with the company.

George L. Henderson has retired as vice president of Kern County Land Co., San Francisco. A civil engineer,



Rockford Blacktop Construction Co., Rockford, Ill., moved clay, gravel, loam for Illinois Toll Road section with B and C Tournapulls with Fullpak scrapers. On one section of project, "C's", like these, loaded in average of .52 min., completed cycles over 2,000' long in 3.52 min.

"Finish a job faster . . . at less cost . . . than any other earthmovers" . . . says Contractor on Illinois Toll Road

Contractor William S. Howard, Rockford, Ill., faced two problems common in earthmoving when his Rockford Blacktop Construction Co. began work on a 4-mile section of the new Illinois Toll Road, just east of Cherry Valley. Heavy, prolonged rains had delayed the actual start of construction. And, once started, the project continued to be hampered by thoroughly soaked and muddied-up work areas.

"We knew from past experience," says Howard, "that the best way to end the delay, and to work in wet ground, was to bring in some Tournapull® scrapers . . . which is exactly what we did. For medium hauls, with a lot of turns, on rough terrain, we used five 18-yard C Fullpak® scrapers. And we brought in three 27-yd. 'B's' for longer hauls . . . where you can make the most of their really big capacity. After that, our section of the road began to take shape fast."

Cost studies show big advantages

Howard has another, more basic reason for preferring these electric-control LeTourneau-Westinghouse workhorses. "We've checked ownership and operating costs on our jobs," he reports. "We figure these machines *finish a job faster, at less cost, than any other earthmovers we've ever used.*"

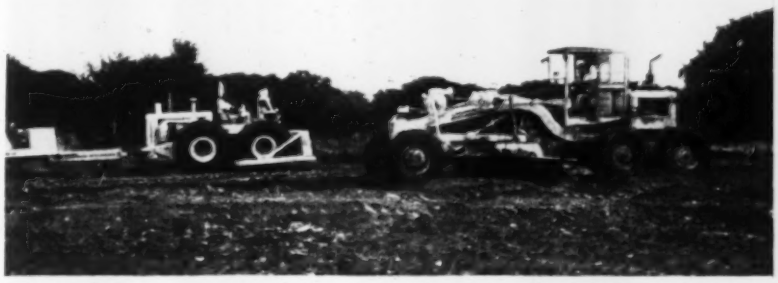
He adds: "The 'C' is good all-around . . . a low-cost-per-yard hauler on all lengths of haul, and in all types of materials. We even use it profitably on haul-road maintenance and clean-up. And the 'B'? Well, sir, *THERE* is a *production* scraper!"

Operator training easy . . .

Training operators to work on Tournapulls is no problem, says Howard. "The only thing they have to get used to," he says, "is that Tournapulls load faster, turn faster, take less time to accelerate, and spread faster on the run!"

Ask L-W Distributor for facts

Get *all* the facts about fast-loading, load-anywhere Tournapulls from your LeTourneau-Westinghouse Distributor. He can also make arrangements for you to see one of these money-making scrapers in action.



Wm. Howard, president of Rockford firm, praises other LeTourneau-Westinghouse tools used on job. Of Tournatractor® he says: "Because it gets around so fast, it's always in demand. We find lots of uses for it, including work as relief pusher, pulling rollers, towing scrapers, odd dozing jobs, backfilling, etc." Of Adams* 550 motor grader: "Our boys really like it. It does a good job spreading fill, and it's fast on haul-road maintenance."

*Trademark CPBP-1718-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

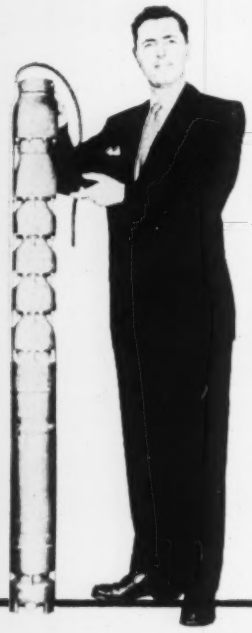
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Best way to meet large scale pumping requirements

For water supply, choose and specify Sumo Submersible Deep Well Pumps

These electrically operated, high capacity pumps are installed directly in the well, completely under water. The entire installation is fast, neat and compact. Sumo Submersibles have been used in installations all over the world. They're completely dependable and designed to operate at highest efficiencies. Sizes from 1/3 hp to 120 hp with capacities up to 1500 gpm.



Engineering Assistance. Sumo's nationwide pumping experts are ready to assist you in problems of selection, application and installation. No obligation, of course.

BULLETIN B-1000 has complete details. Send for a copy.

For drainage, dewatering or flooding choose and specify Sumo Submersible Drainer Pumps These 7½ hp electric submersible drainer pumps are designed to pump water containing up to 20% solids. They're sturdy, reliable and can be used either as portable units or permanent installations. They're ideal for construction work, for dewatering mines, flooding compartments; pumping river or canal water.

BULLETIN B-1100 has details. Send for a copy.

SUMO PUMPS INC.

P.O. Box 983 Stamford, Conn.

Sales Representatives in Principal Cities

he has been with the company more than 30 years and will stay on in an advisory capacity.

Karl M. MacDuffee, civil engineer with the North Pacific Division, Corps of Engineers, has retired after 25 years of government service.

Harold J. Nicholson, for many years city engineer and director of planning for Medford, Mass., has retired at the age of 58 to enter private practice.

Howard H. Terhune of Arlington, Va., retired from the Navy's Bureau of Yards and Docks after 28 years of service with the Navy Civil Engineers.

Public Works

Sam Engelhardt, Jr. has been named director of the Alabama State Highway Department.

Tobert Guarino of High Point, N. C., has been installed as president of the North Carolina section of the American Congress on Surveying and Mapping. He succeeds Ben E. Kirkman of Charlotte.

L. Sterling Hedgpeth, formerly a district engineer with the U. S. Bureau of Public Roads, is with the International Cooperation Administration as highway engineer in charge of ICA work in Indonesia, where a highway program is due to start.

August H. Wagener, former public works commissioner in Rochester, N. Y., has been appointed chief engineer for the Anne Arundel County Sanitary Commission in Maryland. He succeeds Robert H. Bertram, acting chief engineer.

J. Weldon Weir, city manager of Asheville, N. C., has been appointed a member of the North Carolina State Stream Sanitation Committee. He succeeds Walter Clarke of Lincolnton, who has resigned.

Hadley Nation, who has been assistant city engineer will become city engineer for Pittsburgh, Kansas.

Douglas C. Creba, district architect at Toronto for the Canadian government's Department of Public Works, has been named chief architect for the Ontario provincial government's Department of Public Works, Toronto.

Walter F. Winters was appointed King County, Wash., engineer to succeed D. L. Evans who resigned. Mr. Winters was a project coordinator with Grad, Urbahn & Seelye, New York City consulting engineers. He had previously served as engineer for two other Washington counties and also with the state highway department.

Paul E. Clowers, assistant city engineer, Oklahoma City, Okla., was appointed to the newly created job of city planning coordinator.

(Turn the page)

More for your equipment-dollar

L-W graders give you "next-size-larger" performance at no extra cost

This big L-W POWER-Flow† 660 Adams grader, with torque converter, can apply its full engine-power at any speed . . . pushes every bladeful just as fast as 190 hp can move it; travels to 27.4 mph. POWER-Flow 550, at 135 hp, gives you similar advantages. Other heavy-duty L-W graders (80, 115, 123, 160 hp) also work, maneuver, and travel faster. These provide 15 speeds (8 forward, 4 reverse, 3 optional creepers) thru constant-mesh transmission.

L-W Adams† graders give you extra features that increase both the amount and accuracy of grader work. You'll find these LeTourneau-Westinghouse machines actually give you workpower nearly equal to the next-size-larger grader of most other makes! Here's why:

More power-speed combinations — L-W graders give you more gear-ratios in models equipped with standard transmission . . . or the effective workpower of *infinite* ratios with torque converter. You can handle more of your work at full-rpm engine-power . . . develop maximum push-power at fastest practical speed for each job.

Higher speeds, forward and reverse — Faster top-speeds save time on traveling, maneuvering, backing-up to take another cut. You complete extra blading in those minutes — even hours — you save daily.

Extra-slow speeds, too — Creeper gears (optional) on standard-transmission graders, let you apply full horsepower, slow as 0.35 mph (31′/min). One precise, deep cut often does the job — where ordinary graders must make several shallow passes at throttled-down speed.

100% anti-friction drive — On 80 to 190-hp models, anti-friction bearings in engine-to-wheel drive deliver greater percentage of developed horsepower to tandem wheels. There's less friction . . . you get more net push-power.

"Handy-reach" blade controls — L-W Adams power-control levers are arranged for easier, more efficient hand movement . . . cut non-productive blade-swing time, permit faster grading with more confident control.

Positive blade adjustment — Engine-powered moldboard controls on larger L-W models, position blade accurately and fast. Operator has exact control because blade always operates at constant speed, regardless of the number of controls in use. With power applied thru dirt-free gears and short shafts, there's less wear, less "play" . . . for more accurate, one-pass cuts.

Other extra-performance features — Dual-action brakes, rubber-mounted engine, continuous-welded frame, high-arch front axle, ample blade clearance, full-floating rear axle, full line of optional equipment, and many more output-boosting advantages make heavy-duty L-W machines your best buy. You get more grader for your equipment-dollar.

Ask us to prove the extra workpower and value . . . *by demonstration.*

Best in its class for light, general grading, 60-hp Model 220 gives you many big grader features. "220" has 4 working speeds under 6.5 mph; 4 (optional) creepers; speeds to 18.3 mph. Precise, hydraulic blade controls provide 90° bank-cut left and right. 10-ft slide-shift moldboard reaches 54½" outside wheels. Leaning front wheels and wide tread give exceptional stability, easy handling in all conditions.

†Trademark G-1887-G-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

SERVICISED ZERO-LASTIC® JF JOINT SEALER for the JET AGE

Impervious to Jet Fuels...

keeps Joints Sealed UNDER ALL CONDITIONS

Servicised Zero-Lastic JF Sealing Compound is a cold-applied, jet fuel resistant, rubberized tar compound specifically designed for sealing expansion, contraction, or dummy joints in concrete paving of airfields and airports. Zero-Lastic JF is easily applied to joints from ¼" up to 1" or more wide by any of several types of mixer-extruder units. Once installed, it cures internally into a resilient, rubber-like seal which has excellent bond with both sides of the joint. Since Zero-Lastic JF contains no thinner, there is no shrinkage after placing in the joint.

Because Zero-Lastic JF is unaffected by jet fuel or other petroleum solvents used by aircraft, joints sealed with the material stay sealed under the most adverse aircraft re-fueling and maintenance conditions. Zero-Lastic JF can be used with equal efficiency on new or old pavement joints.

Write for complete details on Zero-Lastic JF and other Servicised Joint Sealing Compounds.

SERVICISED PRODUCTS CORPORATION

6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

. . . Men and Jobs

Brooke Cole has been appointed to the new position of public works director in Lexington, N. C. His post of city engineer is now held by Frank Jester, formerly municipal utilities engineer.

Business

Spencer, White & Prentis, Inc., New York City, foundation and heavy construction specialists, are opening a new district office in Pittsburgh, with Roger Bethel as district manager.

George E. Glover has been named manager of the industrial waste department of the Cochrane Corp., Philadelphia equipment manufacturer. He will be in charge of the company's activities in industrial-waste treatment and ion-exchange applications.

Robert A. Bowman has been made vice president of Bechtel Corp. He has been manager of engineering in the San Francisco headquarters of the Bechtel Power and Industrial Division for the past six years.

William C. Love has been named chief, civil engineering, of Brown Engineering Co., Huntsville, Ala.

Frederick J. Mayo has been elected president of Ingalls Shipbuilding Corp. He leaves the position of executive vice president and a member of the board of E. H. McGraw & Co., New York City. Mr. Mayo will make his headquarters at the company's Pascagoula, Miss., shipyards.

Burdette K. Beebe, vice president, Fay, Spofford & Thorndike, Inc., consulting engineers, Boston, will be resident manager of a new office being established by the firm in Phoenix. General consulting work—airports, highways, bridges, industrial facilities, water supply and sanitation—in the western United States, Mexico and Central America will be handled by the new office.

Max R. Horwitz, has been named vice president and director of architecture for Charles Luckman Associates, planning architectural-engineering firm, Los Angeles.

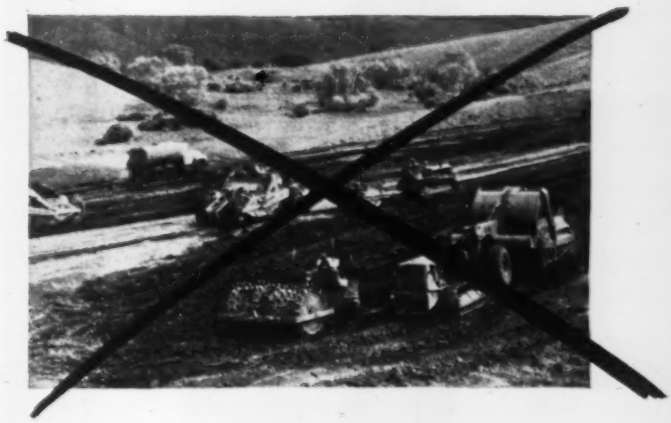
R. Leslie Mullen has been elected president and chief executive officer of Lehigh Structural Steel Co., Allentown, Pa. He succeeds his father, the late Thomas R. Mullen, who was one of the founders of the company. Mr. Mullen was also elected president of the company's two subsidiary organizations, Lehigh Construction Co. and Utilities Service Co.

Thomas W. Moses, president of the Indianapolis Water Co. has been elected president of the Philadelphia Suburban Water Co.

The Frank Briscoe Co., Inc., Newark, N. J., builders, has a new president and vice president. They are respectively:

HOW YOU CAN:

- **speed-up fill compaction**
- **reduce equipment congestion**
- **handle scattered dozing at lowest cost**



With the big yardages hauled by today's larger capacity earthmovers, you stand to lose profits if you must delay hauling cycles to allow time for specified compaction. These delays may be caused by: 1) inefficient compaction tools; or, 2) too many slow-moving dozers, graders, and compaction units working in such a small area that they get in the way of your production units.

To solve this problem — and automatically reduce your equipment investment — you can replace slow-speed dozers and tow-tractors with fast, heavy-duty, rubber-tired LeTourneau-Westinghouse Tournatractor®. Here's how this multi-purpose 218-hp tractor can help you speed-up dozing and compaction . . . and *save you money.*

1. Works fast . . . compacts more fill per day — Powerful L-W rubber-tired tractor tows compactors weighing up to 50 tons. This — together with its high speed, maneuverability, easy handling, and ability to level fill with dozer blade while towing a compactor — makes it possible for Tournatractor to meet specified compaction requirements faster and in fewer passes.

2. Gives bonus compaction equal to extra 20-ton roller — With tires hydroflated, Tournatractor itself provides *bonus compaction equivalent to an extra 20-ton roller.* Rolling action of its broad, low-pressure tires confines and compacts soil under the tread — rather than displacing it. As a result, it helps obtain maximum compaction in less time.

MOBILE "JOB BALANCER"

When compaction work is completed, mobile L-W tractor is ideal for hit-and-run assignments. At a moment's notice, operator can unhitch towed tools and drive to cut area to balance pushers . . . or it can smooth haul roads, build shoulders, handle stockpiling, restore washouts, cut drainage ditches. Tournatractor will handle dozing or towing jobs anywhere on your project, to help complete your work faster . . . at bigger profit.

Let us give you the whole story. We'll be glad to demonstrate this powerful, 17-mph L-W Tournatractor. Ask for full details.

CT-1943-DC-1

Speedy, 218-hp Tournatractor levels and compacts fill in one operation . . . eliminates the need for many specialized tools that cause congestion on the fill. With tires hydroflated, L-W tractor alone provides compaction equivalent to an extra 20-ton roller . . . at a big saving in expense.

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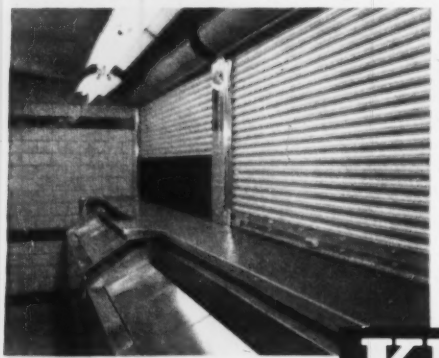
Where quality is a habit

Kinnear Steel Rolling Grilles
CONTROL SPACE

without blocking light, air, sound or vision

Coils Out of View When Not in Use! Artistic, modern beauty and great strength *plus space-saving convenience!* Kinnear Rolling Grilles are ideal for "space control" — closing off corridors, bays, or other room areas. Curtain of heavy round bars locked in rugged steel links defies burglars, trespassers, vandals. Coils upward, stays out of view until closed and locked. Heavily galvanized for lasting beauty (aluminum or bronze also available). For face-of-wall or under-lintel mounting. Any size. Manual or motor control. Send for full information.

KINNEAR Rolling Counter Shutters Also Provide Space-Saving Protection



The counter shutter that coils upward, completely out of the way! Protects with a rugged all-metal curtain when lowered. Made like the famous Kinnear Steel Rolling Doors used so widely in service openings of all types, but with a curtain of one of Kinnear's "midget" slats. For all counter openings up to 20' wide. Steel, aluminum, bronze, or stainless steel. Write for details.

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FACTORIES:
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1742 Yosemite Ave., San Francisco 24, Calif.

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

William F. Kelly, former vice president and general manager; and Austin Helle, who started with the organization 15 years ago as a carpenter foreman and now will be in charge of all construction operations.

George E. Horr, executive vice president since 1951, has been elected vice chairman of the board of Turner Construction Co., New York City. Francis B. Warren, vice president and treasurer, was named executive vice president.

Associations

Max C. Hempt, vice president of Hempt Bros., Inc., Camp Hill, Pa., was elected president of Associated Pennsylvania Constructors. He succeeds **F. C. Wagman**, of Dallastown.

Stanford E. Thal, president of Stanford E. Thal, Inc., Toledo, was elected president for 1959 of the Toledo Chapter of Associated General Contractors of America.

Carl M. Halvorson, of Portland, was elected president of the Portland chapter of Associated General Contractors.

Willard M. Warzyn, of Madison, Wis., has been elected president of the Wisconsin section of the American Society of Civil Engineers.

R. S. Hills, of Summerville, S. C., succeeds **M. B. Hunder**, of Charleston, as president of the South Carolina section of the American Society of Civil Engineers.

Albert C. Chock has been chosen as president of the General Contractors Association of Hawaii. His predecessor was **A. A. Carswell**.

Milt Simpson, of Ball & Simpson, Berkeley, Calif., was elected president of the newly formed Northern and Central California Chapter of Associated General Contractors. Vice presidents are **Paul A. Elsner**, of Swinerton & Walberg Co., San Francisco; **John Delphia**, Patterson, and **J. P. Silvestri**, of Charles L. Harney, Inc., San Francisco.

Meyer F. Wiles, deputy commissioner of the New York City Department of Public Works, was elected president of the Municipal Engineers of the City of New York at the organization's 56th annual meeting.

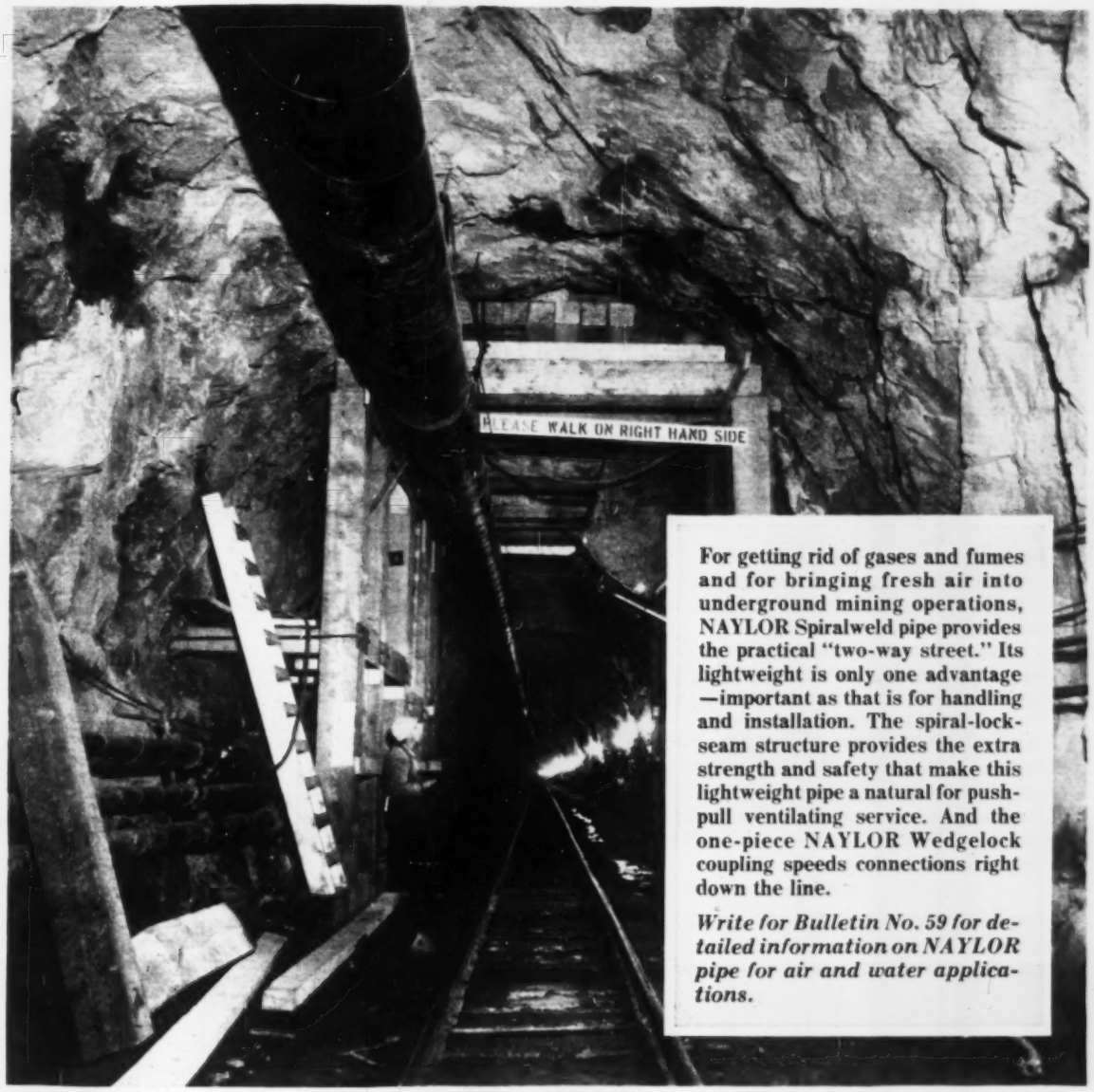
Edward Platoff was elected president of the Louisville, Ky., chapter of Associated General Contractors. He succeeds **K. A. Barker, Jr.**

Education

George Edson Danforth, Ohio architect and educator will become professor and chairman of the department of architecture at Illinois Institute of Technology. He now holds the same position at Western Reserve University, Cleveland.

TWO-WAY STREET

For Ventilation



For getting rid of gases and fumes and for bringing fresh air into underground mining operations, NAYLOR Spiralweld pipe provides the practical "two-way street." Its lightweight is only one advantage —important as that is for handling and installation. The spiral-lock-seam structure provides the extra strength and safety that make this lightweight pipe a natural for push-pull ventilating service. And the one-piece NAYLOR Wedgelock coupling speeds connections right down the line.

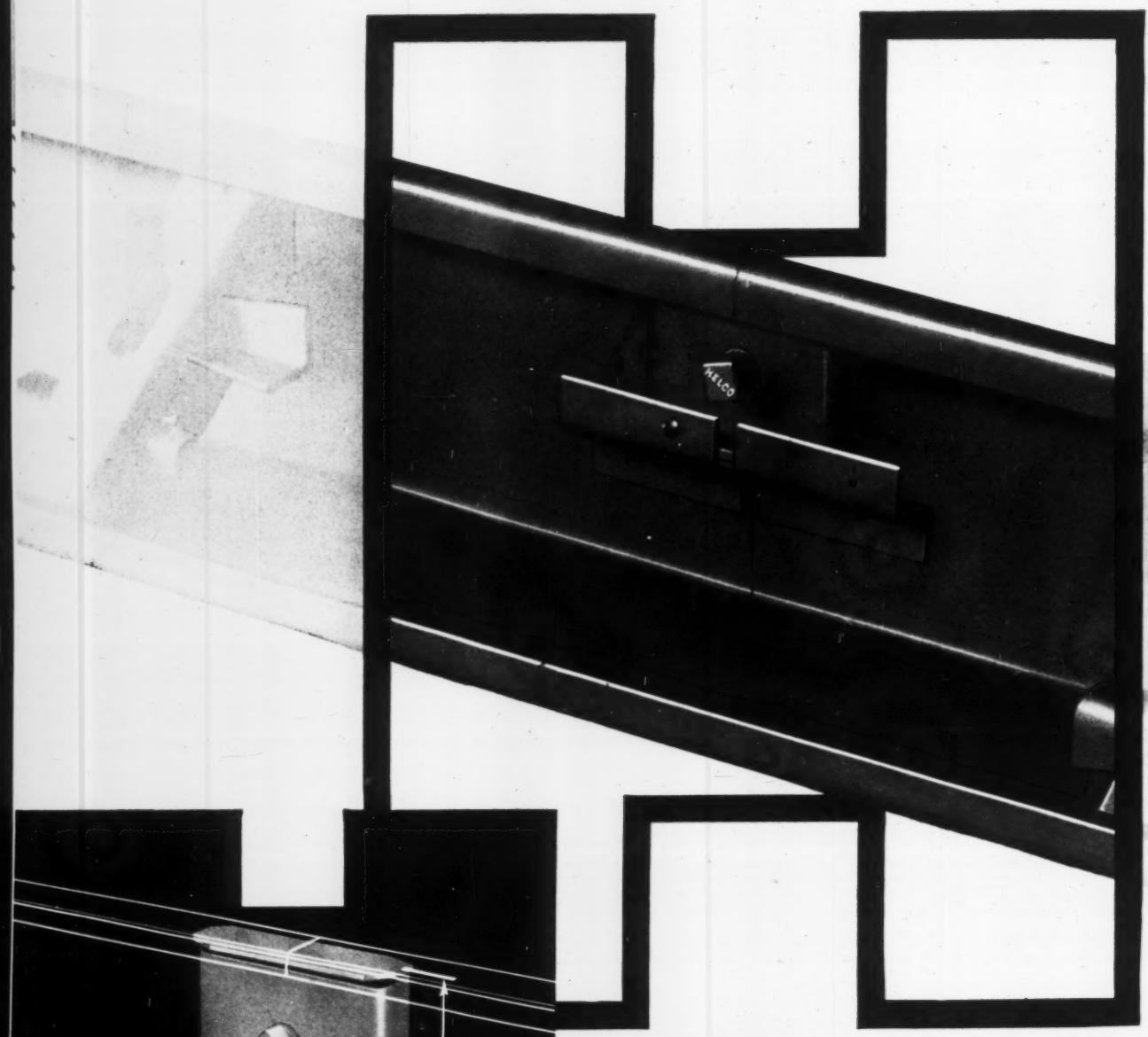
Write for Bulletin No. 59 for detailed information on NAYLOR pipe for air and water applications.

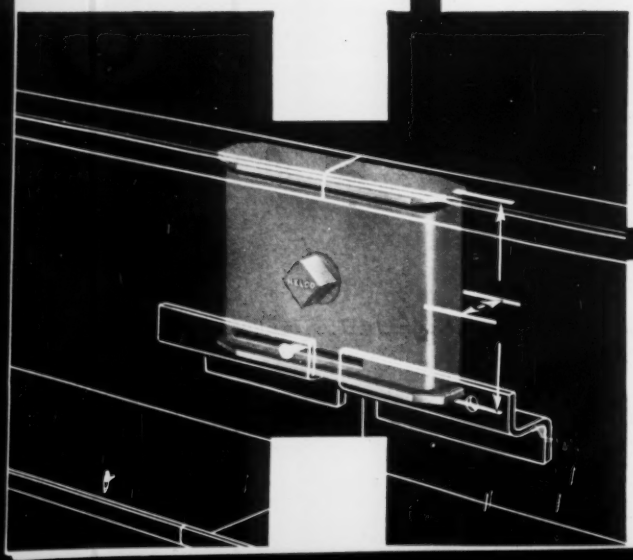
NAYLOR PIPE *Company*

1248 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

HELTZEL'S NEW *Cam-Lok





The cam expands the lock both front-to-back and top-to-bottom to align form tread and face simultaneously.

HELTZEL STEEL

STEEL FORMS!

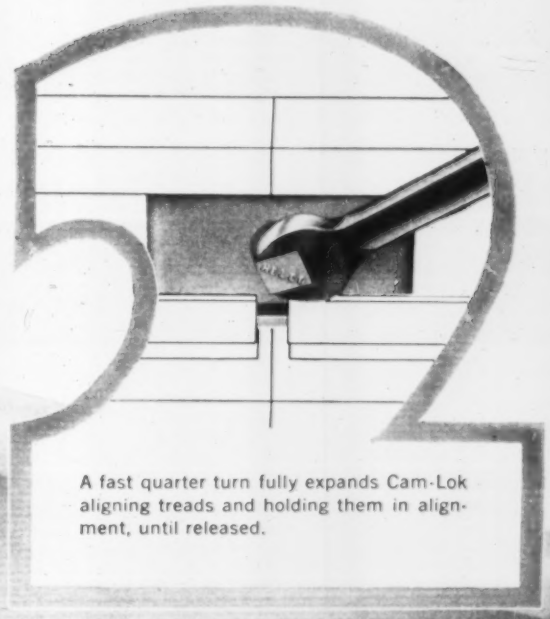
Tapered leads make the Cam-Lok easy to position. This feature also permits greater form-to-form flexibility while setting.

From steel form headquarters—revolutionary new highway forms that go together with absolutely rigid straight-line joints . . . faster, easier than ever before! They're HELTZEL'S NEW **CAM-LOK* STEEL FORMS!

Sturdily constructed on a simple cam principle, the new Cam-Lok slides easily into position. A fast quarter turn of the cam draws the treads of both form sections into alignment—with a joint that can't shake loose regardless of the vertical thrust of the machine weight or the horizontal thrust of spreader and finisher. An **open end** wrench is the only tool needed. **There's no sledging** with resulting tread **and lock damage**—**no chance** for misadjustment, **and the simple** cam mechanism **is positively non-fouling!**

There's more to these new Cam-Lok forms. Full channel stake pockets with angular wedges are stronger and insure better stake retention. They're available in the single or double wedge type with or without upturned flange base. Cam-Lok Highway Forms have a cambered base end and are available for radii forming.

AIRPORT FORMS, too, now come equipped with the fast setting, self-aligning new Cam-Lok. You'll want to know more about this great new idea in highway and airport forms. Write today for your copy of the Heltzel Cam-Lok Bulletin.



A fast quarter turn fully expands Cam-Lok aligning treads and holding them in alignment, until released.

*Patent Pending

FORM AND IRON COMPANY WARREN, OHIO

Here's the New Le Roi 125 Rotary

It's the lightest (2,250 lbs.)... the slowest (1600 rpm) portable 125 cfm rotary air compressor on the market!

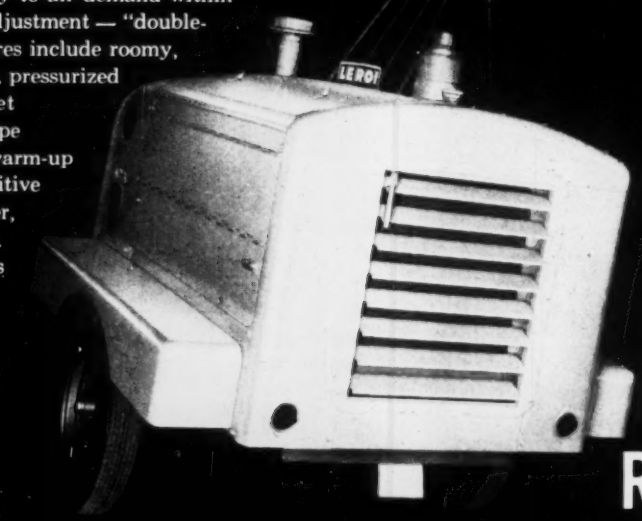
Here's the next best thing to free air power for your construction jobs — the spanking-new, cost-busting Le Roi 125 rotary!

It's the lightest — a mere 2250 lbs. of easy-to-handle air power that you'll hardly notice when shuttling the unit from job to job behind your truck, car, or jeep. But it's rugged enough for your toughest jobs — to take the bumps on any terrain.

It's the slowest — delivers full 125 cfm of free air at 100 psi at only 1600 rpm. Engine and compressor last longer.

It's a gas miser — the proven wet-sleeve overhead-valve Le Roi engine squeezes every ounce of power out of each drop of fuel.

It's loaded — you get 100% capacity modulating control for matching air supply to air demand within 10 psi — one-valve pressure adjustment — "double-life" rotor design. Other features include roomy, full-length tool boxes: oversize, pressurized cooling system. You also get fast 12-volt starting; louver-type adjustable shutters for quick warm-up of engine and compressor; positive lubrication even in cold weather, and caster wheel safety handle. Air-end accessibility eliminates need for removing tanks!



See it — try it! You'll like it! Ask your Le Roi distributor for a demonstration today! Or write Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

LE ROI ROTARY COMPRESSORS

PORTABLE AND TRACTAIR® AIR COMPRESSORS, STATIONARY AIR COMPRESSORS, AIR TOOLS

Obituaries

Maj. Gen. James B. Newman, Jr., U.S.A.F. (ret.), 62, supervisor of design and construction of Washington (D. C.) National Airport in 1939-40. During World War II he was in charge of all ground construction for U. S. and French air units in the European area. He retired as a brigadier general in 1945. Two years later he was recalled to active duty to help plan the Air Force Academy. He was promoted to Major General in 1949.

Philip M. Knox, 79, a civil engineer with the District of Columbia department of sanitary engineering for 35 years. Mr. Knox helped lay out Baltimore & Ohio Railroad's roadbeds through Georgia and the Carolinas during his early years. He joined the District of Columbia government in the early 1900s.

Wilhelm Spannhake, 78, hydraulics engineer of Karlsruhe, Germany. Professor Spannhake first came to this country as visiting professor at Massachusetts Institute of Technology. He played a part in investigations on cavitation at the time of the introduction of the Kaplan-type turbine. After World War II he returned to this country under contract with the U. S. Navy and later went back to Karlsruhe.

Robert B. Mowry, 61, an engineer with Wallace and Tiernan, Inc., of Havertown, manufacturers of water works equipment.

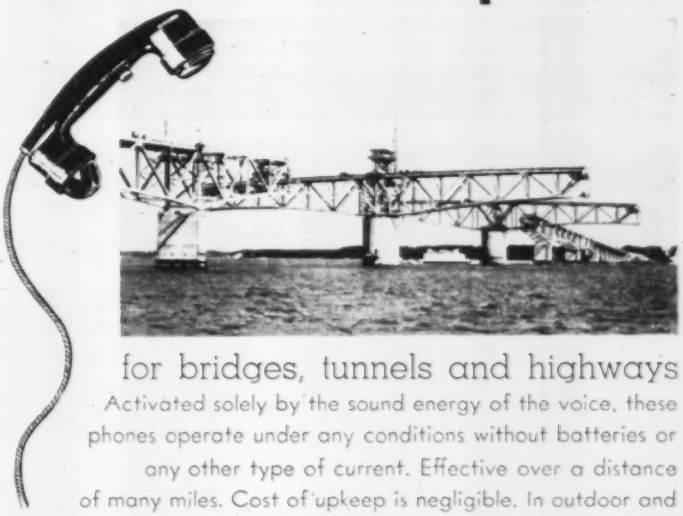
Anthony Wawrzkowicz, 75, a Buffalo civil engineer. He was a graduate of Lwow University in Poland and had practiced civil engineering in Poland before coming to the United States.

Elton Risley, 87, former president of the Hill Dredging Co., Ventnor, N. J. Mr. Risley was an authority on beach erosion and jetty work. During the years he headed the firm it did much dredging and filling work throughout the Jersey shore resort area and in inland waterways from Cape May to New York. Mr. Risley sold his interest in the Hill firm in 1951. Since then he had been president of the Margate Bridge Company.

V. O. Tansey, 67, professor emeritus of geology at the University of Arkansas. A native of Burlington, Iowa, Mr. Tansey received his bachelor's and doctor's degrees in geology from the University of Chicago. He had been a member of the Arkansas faculty since 1925.

(*Turn the page*)

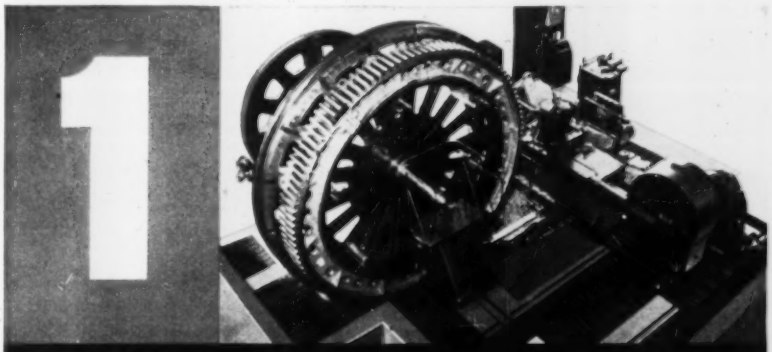
Sound Powered Telephones



for bridges, tunnels and highways

Activated solely by the sound energy of the voice, these phones operate under any conditions without batteries or any other type of current. Effective over a distance of many miles. Cost of upkeep is negligible. In outdoor and indoor models. Systems may be standard or altered to suit any of your requirements. Write for illustrated catalog.

HOSE-McCANN TELEPHONE CO., INC.
761 THIRD AVENUE, BROOKLYN 32, N. Y.



ONE OF A KIND!

This specially designed versatile, internal-external **PRECISION** spur gear cutter is the only one of its type and range in modern industry . . . Cuts any desired pitch or tooth form . . . Max. O.D. 22', Max. I.D. 12' . . . It has cut giant gears for use in Kilns, Crushers, Sugar Mills, Cement Mills, Rotary Dryers & Power Shovels.

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- SPROCKETS
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SPECIAL JOBS—
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U & F adapts the equipment for the job! U & F provides cross lot and spur bracing to protect adjoining structures — and installs H piles for "Asia House" foundations under difficult conditions —perilous subgrade, narrow lot, deep excavation.

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. . . Obituaries

Jacob A. Cartwright, 66, an engineer formerly with the Nashville District of the Army Engineers. He was in the Army's Corps of Engineers in both World Wars. Between wars he served with the Corps in a civilian capacity.

Roy Hebard, 85, president of R. W. Hebard and Company, Inc., New York City engineering and building company. Mr. Hebard worked as a construction engineer in the building of the Panama Canal.

Ewin L. Bruner, 70, architect-engineer, South Pasadena, Calif. From 1923 to 1954 he was a member of the firm of Grant & Bruner, Ltd., architects and engineers, Los Angeles, and designed industrial plants in southern California. He continued in private practice until 1957, when he retired. His earlier experience included work with the Salt Lake Railway, Los Angeles Owens River Aqueduct, Los Angeles City Engineering Dept., California State Harbor Board, and the California State Highway Commission.

John P. B. Sinkler, 83, an architect and former director of the old Philadelphia Department of Architecture. He was an 1898 graduate of the University of Pennsylvania.

Charles A. Holtz, 85, Milwaukee steel fabricator. He was vice president of the Appleton Structural Steel Co., Appleton, Wis., for eight years. Before that he was a director and secretary of the C. Hennecke Co., Milwaukee structural steel company.

Alexis F. Kennedy, 79, a retired partner in the Kennedy Brothers Contracting Co., Youngstown, Ohio. His firm has done much street and road work in eastern Ohio and western Pennsylvania.

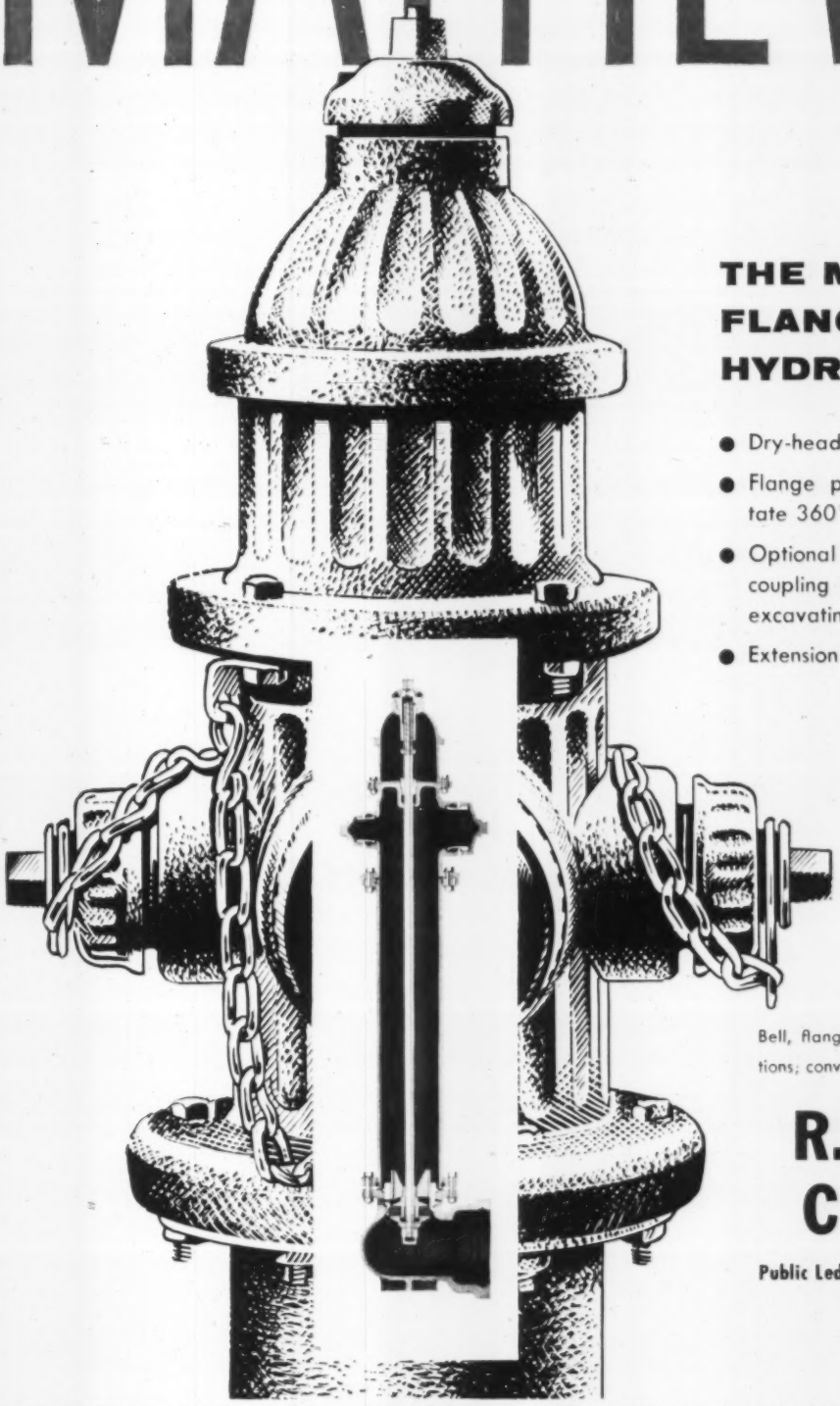
Ralph Silver, 73, of Indianapolis, a project engineer for the Indiana State Highway Department. He was a graduate of Purdue University and was employed for many years as an engineer in the western U. S.

Thorret R. Mead, 84, who organized the Mead-Balch Construction Co., Indianapolis, in 1921. The company built railroad bridges in Indiana, Ohio, Kentucky and Illinois.

Eric Fleming, 62, architectural designer and civil engineer with the Public Service Gas & Electric Co. of Newark, N. J. Mr. Fleming supervised design of the ventilating system for the Holland Tunnel in the 1920's.

(*Obituaries continued on p. 196*)

MATHEWS



THE MATHEWS FLANGE BARREL HYDRANT

- Dry-head construction
- Flange permits nozzle section to rotate 360°
- Optional breakable flange and stem coupling permits replacement without excavating
- Extension section available

Bell, flange or mechanical-joint pipe connections; conventional or "O" ring packings

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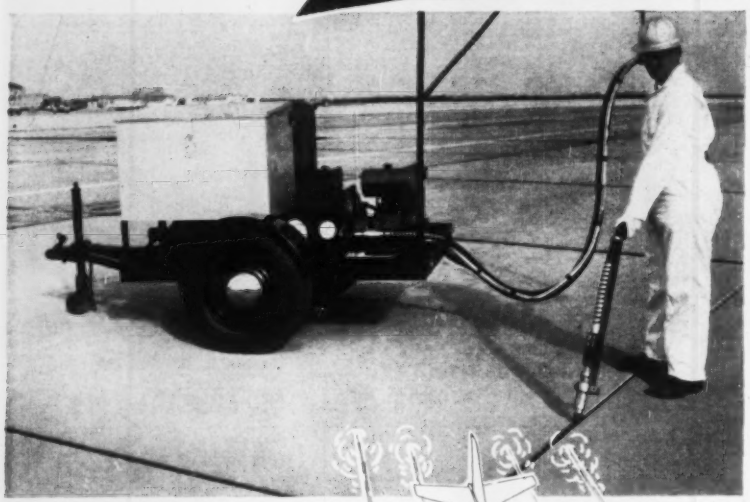
Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

ALLIED Jet Seal



RESISTS JET BLASTS

Allied JET SEAL Product 9015-M will withstand the TERRIFIC HEAT AND BLAST FORCES OF JETS—as well as be resistant to jet fuels and other solvents. This major advance in sealants is positive in adhesion, cohesion, resilience and low-temperature ductility. (−20 F) Application is simplified with the compact applicator, originated by Allied. JET SEAL is quick curing and within the limits of federal military budgets. Write for complete information on the outstanding and proven features of JET SEAL, 9015M.

NOTE: JET SEAL and the exclusive Applicator originated by Allied, compose the only complete joint sealing system of material and application developed for the jet age.

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39th St. Station • Oklahoma City 12, Oklahoma
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. . . Obituaries

Erwin T. Lavery, 58, assistant city engineer of Burlington, Vt., since 1927. He had been employed by the city of Burlington since his graduation, in 1924, from the University of Vermont. He served as treasurer of the Vermont Society of Engineers from 1942 to 1948.

William N. Brown, 85, retired surveyor and early user of aerial photography for mapping. He was an 1893 graduate of the Virginia Military Institute and worked as a mining engineer in Alaska and Mexico early in his career. He mapped the Mississippi River in 1929 for flood control projects.

McDonald Smith, 56, head of the standardization section in the engineering division of the Navy Bureau of Yards and Docks. Mr. Smith was an engineer for the Reconstruction Finance Corp. before joining the Navy bureau in 1949.

Thomas H. Allen, 77, president of the Memphis Light, Gas & Water Commission, who led the City's vast utility system throughout a period of unprecedented growth.

Mr. Allen was the driving force behind the huge electric generating station in Memphis, Tenn., that now bears his name (ENR Nov. 13, 1958, p. 40). Last year the University of Tennessee presented him its first N. W. Dougherty award.

Roy G. Finch, 74, consulting engineer, Albany, N. Y., and for many years a member and secretary of the New York State Board of Licensing for Professional Engineers and Land Surveyors. Mr. Finch was also the last person to hold the title of State Engineer of New York. The title was changed to Superintendent of Public Works about 30 years ago. A graduate of Rensselaer Polytechnic Institute in 1906, he joined the State Engineering Department in 1908. He left in 1926 to enter private practice.

Charles L. Inscho, 84, Columbus, architect and retired senior member of Inscho, Brand & Inscho, architects. His work included homes, commercial buildings, schools and churches.

Harrie T. Lindeberg, 78, architect and former consultant on foreign buildings to the State Department.

Edwin J. Coppage Sr., 84, engineer and former secretary-treasurer of the old Southern Ferro Concrete Co., Atlanta. He helped design the Atlanta Terminal Station and Rhodes-Haverty building.

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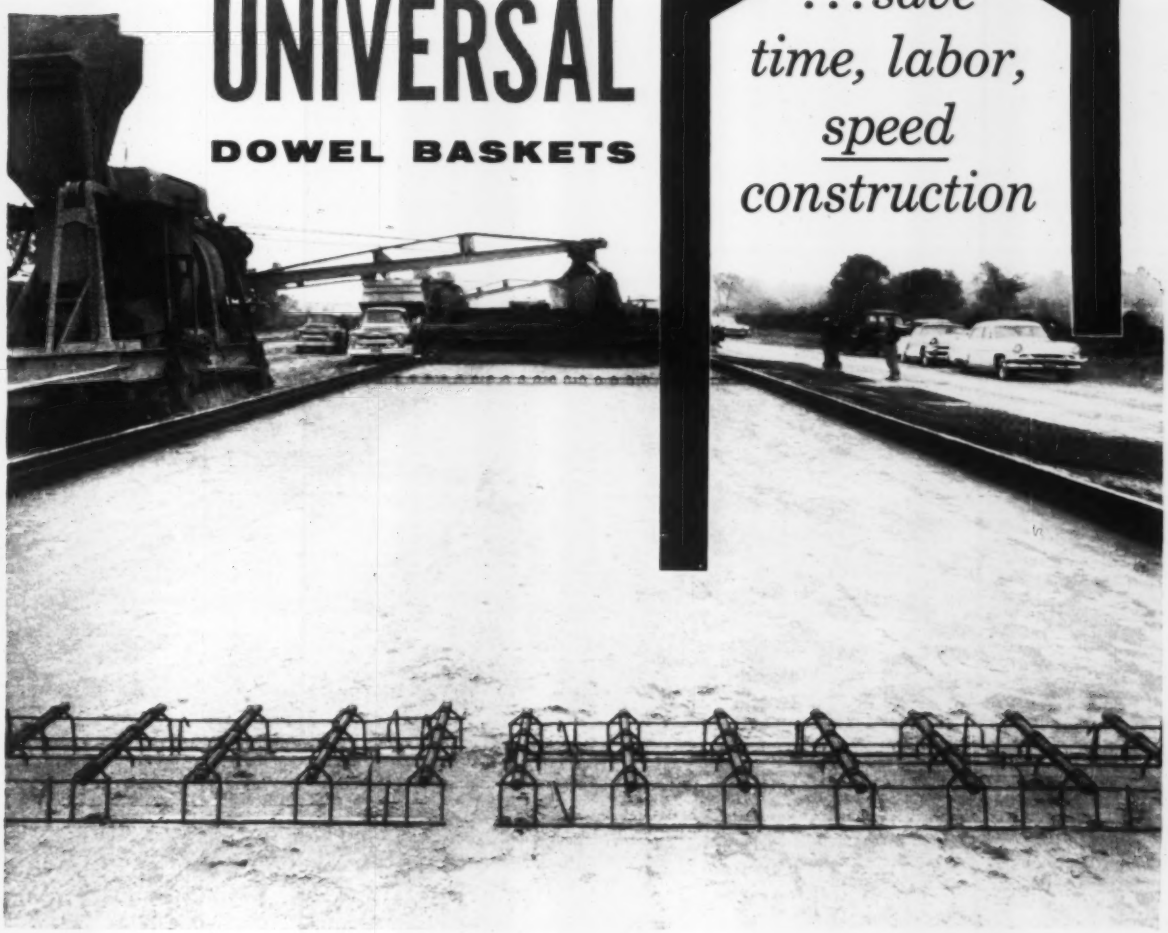

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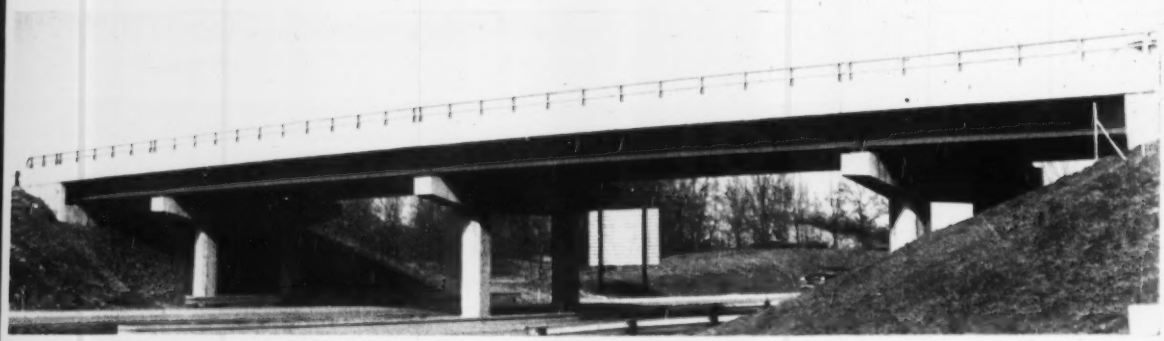

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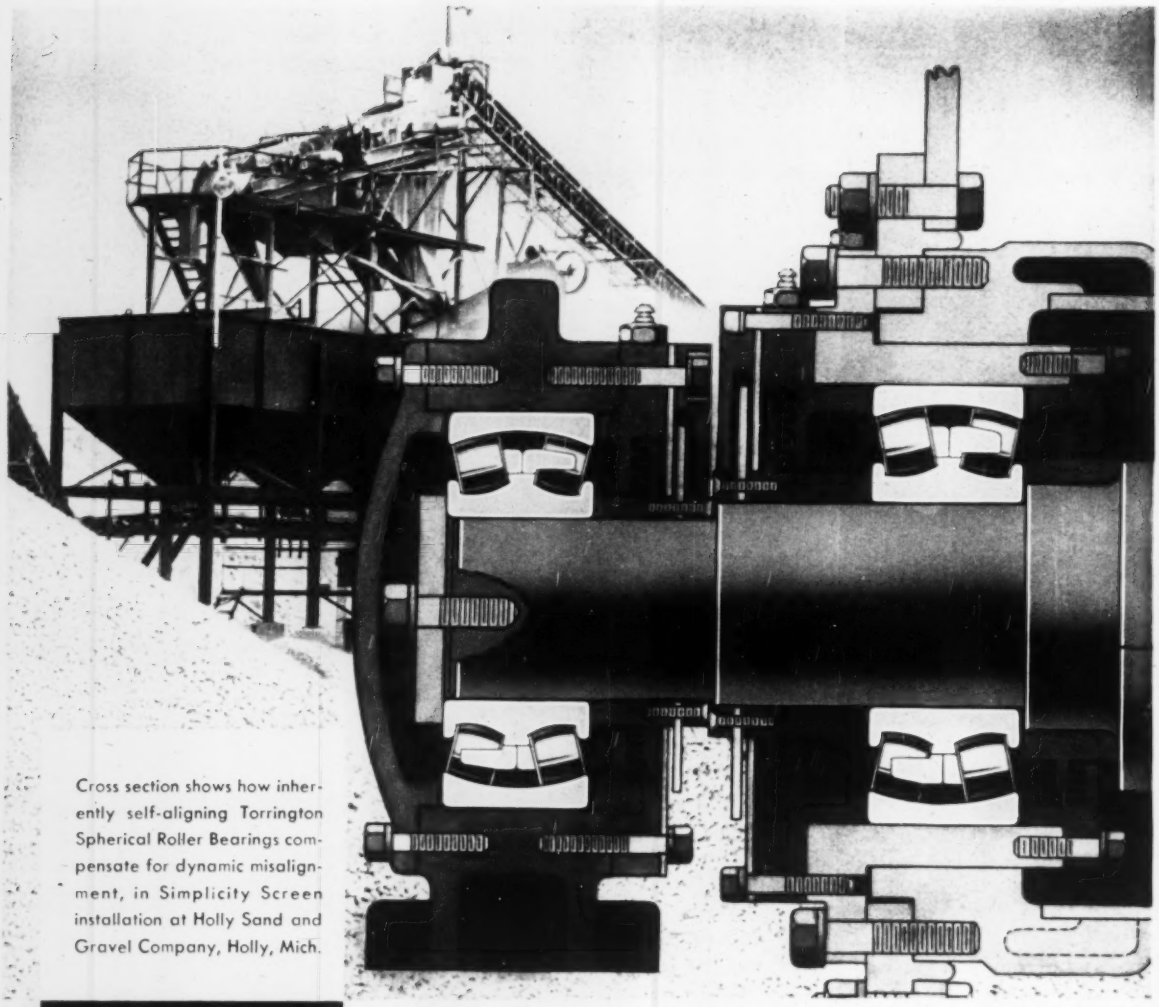

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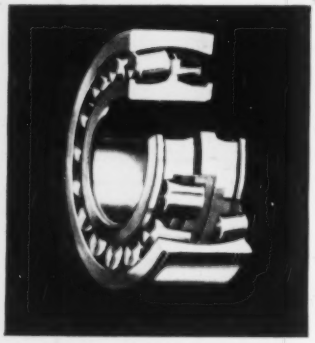

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Forward-Looking Text

REINFORCED CONCRETE FUNDAMENTALS—By Phil M. Ferguson. 604 pages. John Wiley & Sons, Inc., New York, N. Y. Chapman & Hall, Ltd., London. $9.50.

This textbook on reinforced concrete anticipates general acceptance of ultimate-strength design. It presents the basic concepts of this type of design for beams, columns and slabs. Current methods of "elastic" design also are lucidly explained, but the emphasis is on ultimate strength.

As pointed out by the author, the ACI code (which is incorporated in an appendix of the book restricts ultimate-strength design only to cross sections of beams and columns. Nevertheless, in expectation that the ACI code will recognize the ultimate-strength design of slabs and limit-load design of rigid frames in the not-too-distant future, he has incorporated chapters on each subject.

For ultimate-strength design of slabs, the author resorts to the yield-line theory. This assumes that as loading is increased on a slab and the yield point of steel reinforcing is reached, the slab rotates freely about a line (a generalization of the concept of "plastic hinge" in limit-load design of continuous beams). Further increase of load develops new yield lines. The slab will fail when sufficient yield lines form to convert the slab to a mechanism, capable of unlimited deformation without increase in load.

Material on ultimate strength of reinforced concrete and elastic theory are handled separately.

The book also has a chapter on prestressed concrete. This covers both elastic and ultimate-strength design.

Multistory Residences

APARTMENTS AND DORMITORIES—By the Editors of Architectural Record. 232 pages. F. W. Dodge Corp., New York, N. Y. $8.95.

This book on multistory residential design consists of articles that were published in Architectural Record from 1950 to 1958. They include general analyses of housing and detailed descriptions of 53 projects. About one-quarter of the book is devoted to dormitories and other college housing.

The opening article, by the late Thomas S. Holden, vice chairman, F. W. Dodge Corp., discusses expenditures for housing and the effect on them of changing living standards. He points out that after a long downward trend, the percentage of the nation's total consumption dollars spent for shelter started to increase after 1946, the first postwar year. From 1946 to 1957 the percentage rose from 9.28 to 12.30. He expects this trend to continue.

Succeeding articles delve into housing patterns, sociological problems, means of cutting construction costs, and heating systems. Then, the 53 projects are taken up in succession.

A Contractor's Biography

THE DANIEL V. MCEACHERN STORY—Saga of a Seattle Scot—by Dr. E. C. Nance. 246 pages. The College Press, College Place, Wash.

Not enough books like this are written. And because they aren't, much of the real history of construction in America—its romance, great deeds, successes and failures—is being lost.

This book about Dan McEachern and his General Construction Co. of Seattle is therefore a welcome contribution. It tells the story of a Scotch-American boy born in Michigan in 1879, raised to the age of 10 in North Dakota and grown to manhood in Seattle, Washington, who formed a love for construction early and never lost it.

With his older brother, John, and his younger brother, Frank, he organized the J. A. McEachern Co. in 1911, after he and John had followed separate paths in railroad construction to berths as general superintendents. Fifteen years and a good many contracts later the company teamed up with the General Construction Co. of Spokane to get the $3 million contract for Owyhee Dam in Oregon, and in 1932 the McEachern brothers bought General and merged their company with it.

For the past quarter century the name of General Construction Co. has appeared wherever big jobs have been done—sometimes alone, more often in joint ventures such as General-Shea-Columbia or General-Shea-Morrison or Morrison-Utah-General, to mention a few. Famous jobs, which have felt the McEachern touch, are Parker Dam, the Colorado River Aqueduct, Bonneville Powerhouse, Grand Coulee Power house, Ross Dam, Tacoma Narrows Bridge, Anderson Ranch Dam and Hungry Horse Dam. General is in on the Snowy Mountain project in Australia, helped Henry Kaiser launch the Permanente Cement Co., and has owned and operated shipyards on the west coast.

All of this history comes alive in the book, as the author unfolds Daniel McEachern's stimulating views on life in general and the construction business.

(Turn the page)

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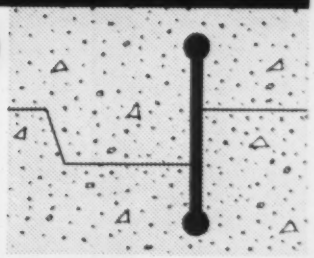

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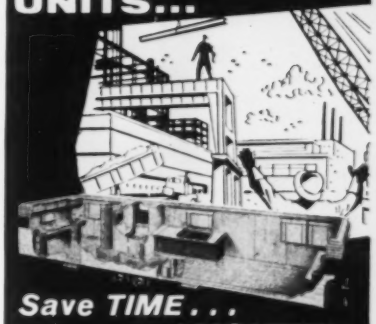

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. . . Books

Prestressing Principles

PRE-STRESSED CONCRETE: THEORY AND DESIGN—By R. H. Evans and E. W. Bennett. 294 pages. John Wiley & Sons, Inc., New York, N. Y. $10.

Printed in Britain, this book is intended both for students and engineers. It therefore places major emphasis on basic principles of prestressed concrete construction. Extensive reference is made throughout to experimental work to confirm and amplify theoretical conclusions.

The book is divided into three parts:

Part I is devoted to exposition of the principles applicable to all types of prestressed concrete structures.

Part II deals with the design of simply supported beams.

Part III is an introduction to more complex members and structures.

It covers composite precast, prestressed and cast-in-place construction, masts, piles, roads, runways, foundations, tunnel linings, continuous beams, tanks, domes and shells.

The text may be difficult for U. S. engineers and students to follow because the British authors use unfamiliar symbols. However, explanations, in general, are clear.

Thin-Wall Construction

THE CONTEMPORARY CURTAIN WALL—By William Dudley Hunt, Jr. 454 pages. F. W. Dodge Corp., New York, N. Y. $12.75.

In the 1950's a trend developed toward enclosing tall buildings with thin walls supported only by the structural frame. This book is an elementary treatment of this type of construction.

The author traces the history of curtain walls and the reasons for the development of the new thin enclosures. He lists the properties required of these walls, their composition and methods of joining and anchoring them.

Since a wide variety of materials have been used for thin walls, the book devotes much space to a discussion of materials—aluminum, stainless steel and other metals; porcelain enamel, glass and plastics; concrete, stone and burned clay; composite panels and organic coatings.

Methods of assembling panels are taken up in a relatively long chapter. Costs also are covered, but very briefly.

In the final chapter, the author takes a peek into the future. He calls attention to the problems that need solution and predicts that "the curtain wall is here to stay." He foresees development of curtain walls that serve several purposes besides only that of enclosure—heating and lighting, for example.

(*Books continued p. 204*)

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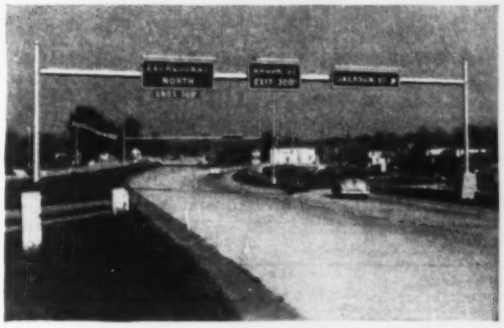

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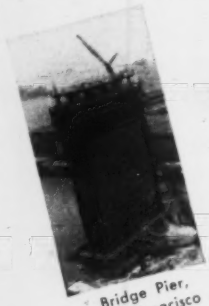
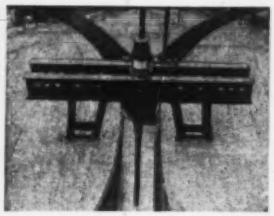


Bridge Pier, San Francisco



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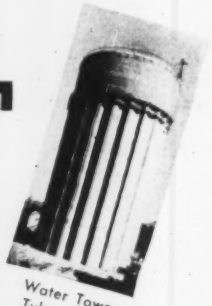
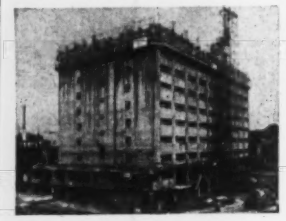


Water Tower, Tyler, Texas

Apt. House, Memphis, Tenn.



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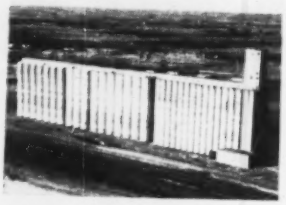

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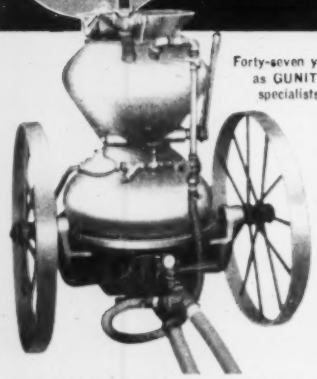

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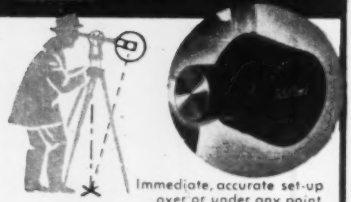

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Stress-Analysis Text

INTRODUCTION TO THE THEORETICAL AND EXPERIMENTAL ANALYSIS OF STRESS AND STRAIN—By A. J. Durelli, E. A. Phillips and C. H. Tsao. 498 pages. McGraw-Hill Publishing Co., New York, Toronto, London. $12.50.

Though intended primarily as a textbook, this volume should be very helpful to engineers who wish to brush up on stress analysis or to become acquainted with latest methods for measuring stress and strain.

The book is divided into two parts. The first develops the necessary theoretical background for the second, which deals with experimental techniques.

In Part I, the theory of elasticity is explained in detail. The three-dimensional equations of the theory are developed first. These then are simplified to obtain the two-dimensional equations. The authors argue that this is a more logical procedure than development of the theory by generalization of the two-dimensional equations.

The book presents many examples of the applications of basic concepts to problems of industrial interest.

Part II starts out with fundamental concepts in strain measurements. It then takes up statistical methods and their application to experimental stress analysis. Next it demonstrates the utility of dimensional analysis in this field before moving to strain measurement.

Experimental techniques covered in this part are grid and brittle-coating methods and use of mechanical strain gages. Other methods will be presented in future volumes. The authors say they have emphasized brittle-coating methods in this book because these methods have been underemphasized in other books. The authors have made original contributions in this field.

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MAPS OF THE LOWER MISSISSIPPI RIVER—Five revised topographic quadrangle maps: Hunter and Wynne, Ark.; Southwest Pass and Oak Grove, La.; Artonish, La.-Miss. Mississippi River Commission, P. O. Box 80, Vicksburg, Miss. 30 cents each. Descriptive material free on request.

FLOOD-CONTROL AND NAVIGATION MAPS OF THE MISSISSIPPI RIVER (1958 edition)—122-sheet folio includes 62 maps. Mississippi River Commission, P. O. Box 80, Vicksburg, Miss. $2.25.

UNITED STATES TOPOGRAPHIC MAP SERIES—prepared by the Department of the Army and published by the Geological Survey. Of 469 maps, 342 are now available. Geological Survey, Washington 25, D. C. 50 cents each.

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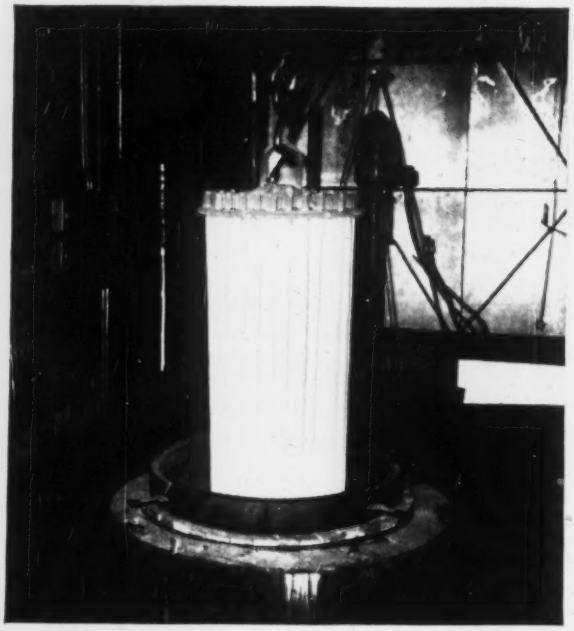

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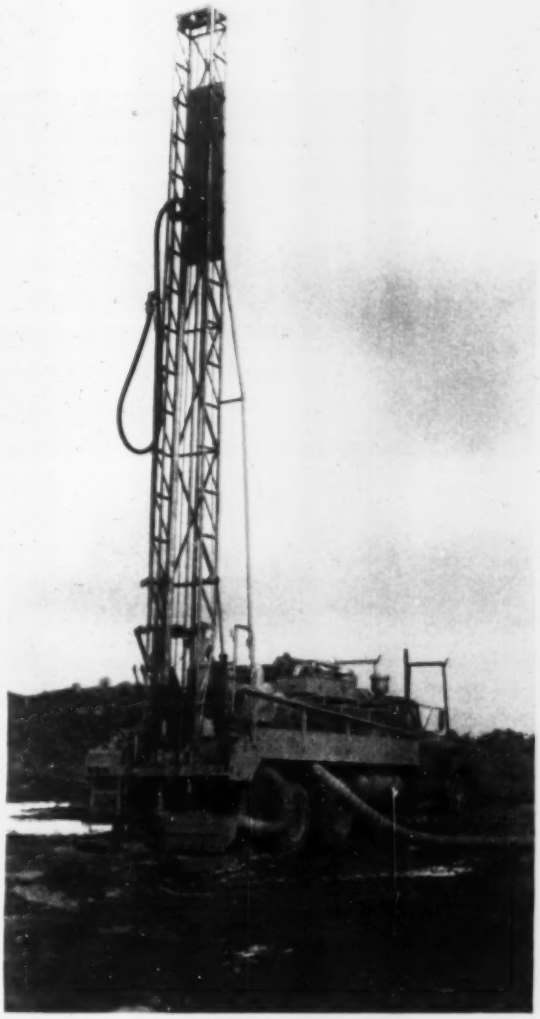

In-the-hole power for rotary rigs—New Gardner-Denver "Mole-Dril"* rides with the bit through rock . . . delivers more striking power than any other drill of its size.

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Gardner-Denver Company, Quincy, Illinois

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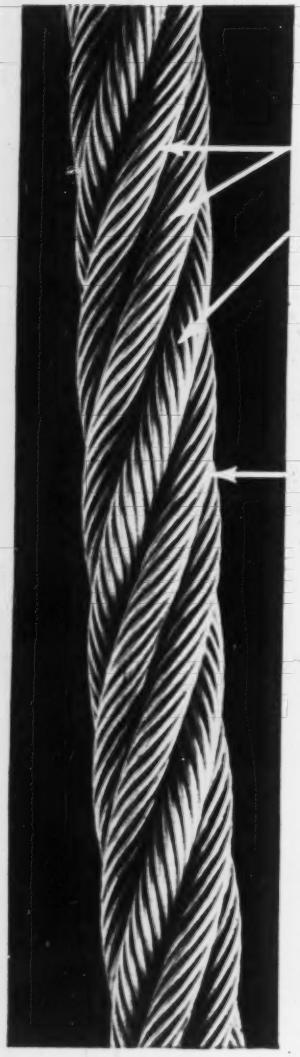
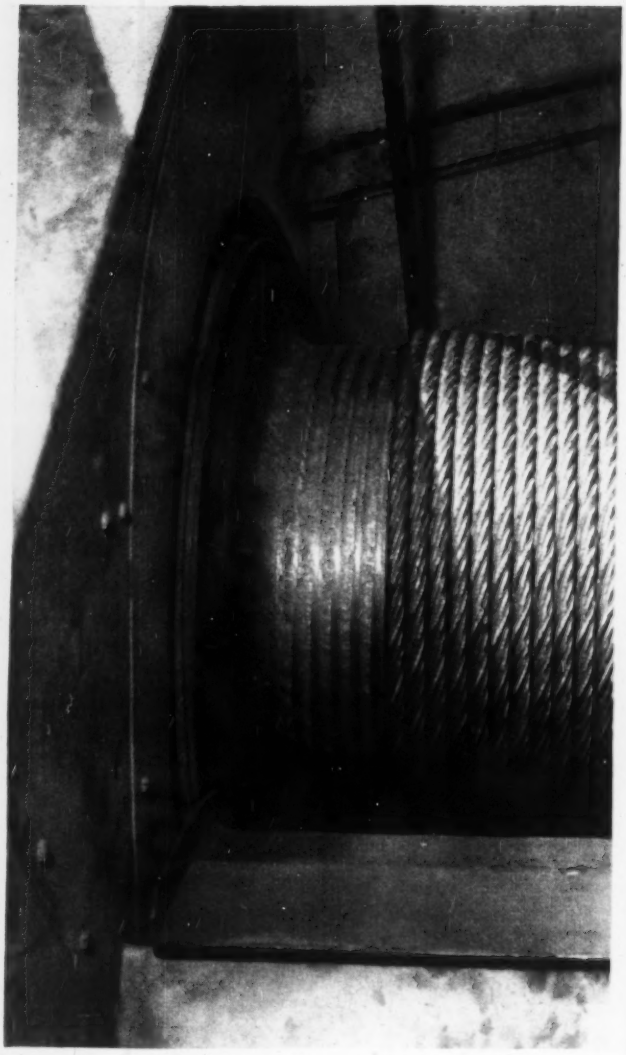
*Trade-Mark



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristic.

Heavier outside wires in each strand have greater resistance to abrasion.



"... we would never hesitate to recommend it"

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This company continues: "We have been using your Roebling Herringbone* for about one year. We find it is one of the best ropes we have ever used, outlasting previous ropes three to one. It is good that such a reliable rope is available."

This is a direct field quote on the most remarkable development in wire rope in years . . . a new concept in wire rope design. Roebling Herringbone is the regular lay and Lang lay wire rope —two-ropes-in-one rope—combining the best features of both.

Herringbone delivers extra flexibility, extra abrasion resistance, unusual structural stability, extra resistance to shock, easy operation over sheaves and drums and smooth spooling properties.

We recommend Herringbone without reservation for general hoisting and the entire range of heavy-duty equipment. Your Roebling Distributor or Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, will give the full and fabulous details. *Reg. App. For

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ROEBLING
HERRINGBONE
WIRE ROPE

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† Vt., Winooski—BUILDING MODIFICATION—BA 3/23—Base Procurement Office, Ethan Allen Air Force Base, modification Bldg. 1306, Airmen's Dormitory, Ethan Allen Air Force Base, IFB 43-600-59-42. CD 8/28.

† Me., Bangor—WATER SUPPLY MAIN—BA On Or About 3/25—U. S. Eng., 562 Congress St., Portland, pumping station and water supply main, Missile Facility (FY-58), east side of Broadway, near Burleigh Rd., 1 mi. east of Rte. 15 and 2½ mi. north of Bangor, Dow Air Force Base, ENG-19-016-59-104. $50,000-$100,000. CD 9/17/57.

Conn., Hartford—BA 4/2—Greater Hartford Flood Control Comn., 11 Asylum St., replace Asylum Ave. Bridge over North Branch of Park River. $100,000. CD 2/14/57.

BUILDINGS—BA

▲ Conn., Woodbridge—SYNAGOGUE, etc.—BA 4/2—Congregation B'Nai Jacob, 347 George St., New Haven, 1 story, steel, brick synagogue, assembly hall, and religious school, Rimmon Rd. $1,000,000. Fritz Nathan, 200 Central Park South, New York, N. Y., archt., Fred S. Dubin & Assocs., 178 S. Whitney St., Hartford, mech. engrs. CD 7/15.

BUILDINGS—LB & CA

▲ Mariani Constr. Co., 222 Forbes Ave., New Haven, Conn., CA $1,500,000, 180x330 ft. RELIGIOUS SCHOOL and SYNAGOGUE, Ridge Rd., HAMDEN, CONN. Temple Mishkan Israel, 380 Orange St., New Haven, Conn. Awarded Mar. 5. CD 5/16.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

Pa., Phila.—LIGHTING FACILITIES—BA 3/23—Dpt. Procurement, City Hall Annex, Bid 6077, installation lighting facilities for aprons, loading platforms and offices and changes in power distr. on municipal Piers Nos. 38 and 40, South Delaware River, for Div. Commerce, Div. Port Operations. CD 11/12/52.

Pa., Phila.—BA 3/24—Dpt. Procurement, City Hall Annex, Bid 2241, water mains Regina St., etc.; Bid 2244, water main, St. Georges Rd. from point approx. 1100 ft. W. of McCullum St. to point approx. 1520 ft. W. of McCullum St.; for Water Dpt. CD 11/8.

† New Jersey—BA 4/2—U. S. Eng., 111 E. 16 St., New York 3, N. Y., dredging to depth of 12 ft. at mean low water involving removal approx. 83,000 cu. yd., place measurement, material other than ledge rock from Hackensack River, Serial No. CIVENG-30-075-59-40.

BUILDINGS—BA

† Md., Aberdeen Proving Ground—OPERATIONAL APRON, etc.—BA 3/31—Base Procurement Office, Aberdeen Proving Ground, operational apron and protective shield at Transonic Range, IFB 59-170B. CD 11/19/52.

▲ Md., College Park—COLLEGE OF BUSINESS, etc.—BA 4/2—State Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, brick, block, concrete, steel College of Business and Public Administration, University of Maryland. $1,500,000. Plans deposit $50. Edwin W. and Wm. T. Booth, Salisbury, Md., archts. CD 3/13.

† Maryland—HOUSING—BA About 4/15—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., 16 Capehart housing units, Pomonkey, ENG-49-080-59-39 (40). Plans deposit $25. Mills, Petticord & Mills, 3308 14th St. N.W., Wash., D. C., archts. CD 12/29, under LB.

BUILDINGS—SLC

N. Y., Stony Point—SCHOOL, etc.—Archdiocesan Bldg. Comn., 451 Madison Ave., New York, Zone 22, soon lets contract Immaculate Conception School and Convent. $400,000.

N. Y., West New Brighton—HOSPITAL—Archdiocesan Bldg. Comn., 451 Madison Ave., New York, Zone 22, soon lets contract St. Vincent Hospital addn., 355 Burritt Ave. $750,000. York & Sawyer, 101 Park Ave., New York, Zone 17, archts. CD 2/12.

HEAVY CONSTRUCTION—LB & CA

▲† Arundel Corp., 334 Furman Ave., Brooklyn, N. Y., LB $1,578,721 (2 bidders), dredging and rock removal to depth of 37 ft. below mean low water involving removal 81,800 cu. yd. place measurement of rock and 75,900 cu. yd. place measurement of material other than rock from New York and New Jersey Channels, Section 4, Rock Area 14, CIVENG-30-075-59-35, NEW YORK and NEW JERSEY. U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids Mar. 5. CD 2/9.

Frances Lavigne, Norfolk, N. Y., LB $121,816 (6 bidders), bldgs., roads and utilities for Coles Creek Camping Area near Waddington, St. Lawrence Co., Spec. No. PA-5-11046, St. Lawrence Contr. No. SL-52, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Mar. 5. CD 2/6.

S.A.E., Milan, Italy, LB $284,700 (8 bidders), furnishing, del. f.o.b. destination, structural steel for structures for 115 kv and 230 kv switchyard in Lewiston, Niagara County, Spec. No. PA-N-23020, Niagara Contr. No. NP34, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Mar. 5. CD 2/10.

† Gottlieb Contg. Co., 180-11 Jamaica Ave., Jamaica, N. Y., LB $89,700 (11 bidders), approach lighting sys., U. S. Naval Air Station, Floyd Bennett Field, NBy 21261, Spec. No. 212e1/58, BROOKLYN, N. Y. Dist. P. Wks. Office, Rm. 524, Federal Office Bldg., 90 Church St., New York 7, N. Y. Bids Mar. 5. CD 2/27.

† John W. Cowper, 1945 Sheridan Dr., Buffalo, N. Y., LB $575,870 (14 bidders), air force facilities (FY-1959), Lockport Air Force Base, ENG-30-075-59-122, LOCKPORT, N. Y. U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids Mar. 5. CD 3/2.

† Isaac Degenaars, Inc., 231 Greenwood Ave., Midland Park, N. J., LB $474,700 (8 bidders), air force facilities at Highlands Air Force Station, ENG-30-075-59-124, HIGHLANDS, N. J. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Mar. 5. CD 1/30.

Canova Bros., 5134 Navahoe St., College Park, Md., LB $194,866 (15 bidders), Contr. 2097-S, Paint Branch Trunk Sewer from Baltimore-Washington Blvd. to Little Paint Branch Jct., HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Mar. 2. CD 2/26.

BUILDINGS—LB & CA

Country Club Homes, c/o Siegmund Spiegel, 2066 Front St., East Meadow, N. Y., Owner Builds, $450,000; 25 HOUSES, Round Swamp Rd., BETHPAGE, N. Y.

Dartmouth Leasing Corp., 97-27 64th Rd., Forest Hills, N. Y., Owner Builds, $500,000, 6 story APARTMENT for 64 families, incl. 21-car GARAGE, 4114 Ninth Ave., BROOKLYN, N. Y. Jack Brown, c/o owner, archt. CD 2/19.

Henry Richmond, 349 E. 149th St., New York 51, N. Y., Owner Builds, $590,000, 6 story APARTMENT, east side of Oxford Ave. south of W. 235th St., Bronx Boro, NEW YORK, N. Y. Herbert & Clarence Libein, 1841 Broadway, New York 23, N. Y., archts. CD 2/3.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000, industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — Middle West
Middle Atlantic — West of Mississippi
South — Far West

PROPOSED WORK
Water Supply — Public Buildings
Sewers, Waste Disposal — Mass Housing
Bridges — Commercial Buildings
Streets & Roads — Industrial Buildings
Earthwork, Waterways — Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

Clovermere Park Homes, c/o Henry A. Klar Realty Co., 165 Hempstead Turnpike, West Hempstead, N. Y., Owner Builds, $400,000 (addnl. section), 20 HOUSES, Jerusalem Ave., WANTAGH, N. Y.

▲ Harold Walsky & Leonard Barschi, d/b/a Walsky Constr. Co., 111 Legion Place, Hillsdale, N. J., Owner Builds, $5,000,000, 228 HOUSES, Park and Homestead Aves., PARK RIDGE, N. J.

▲ Kramer & Zamore, Hillsdale Ave., Hillsdale, N. J., Own Forces, $1,750,000, 72 HOUSES, Washington Lake, Washington Twp., WESTWOOD, N. J.

▲ Wilputte Coke Oven Div. Allied Chemical Corp., 40 Rector St., New York, N. Y. CA Est. $6,000,000, 59 COKE OVENS, Pittsburgh Works, 7th Ave., PITTSBURGH, PA. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh, Pa. CD 11/19.

▲ Consolidated Engineering Co., Inc., St. Paul and Franklin Sts., Baltimore, Md., LB $7,769,000, 250-bed HOSPITAL, Caton and Wilkins Ave., BALTIMORE, MD. St. Agnes Hospital, Caton and Wilkins Ave., Baltimore, Md. Bids Mar. 4. CD 2/4.

SOUTH

HEAVY CONSTRUCTION—BA

† La., Alexandria—HANGAR IMPRVS.—BA 3/30—Base Procurement Office, England Air Force Base, rehabilitation of Hangar Bldg. T-111, England Air Force Base, IFB-16-600-59-39. CD 2/5.

† Va., Norfolk—CONDENSATE LINES—BA 3/31—Dist. P. Wks. Office, 5th Naval Dist., Room 307, Bldg. N-26, U. S. Naval Base, replacement condensate lines, CINCLANT, Naval Base, NBy 20491, Spec. 20491/58. $100,000-$250,000. CD 9/8, under Public Buildings.

▲† Fla., Mayport—DESTROYER SLIPS—BA 4/16—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., destroyer slips, U. S. Naval Auxiliary Air Station, NBy-21109, Spec. 21109-58. Over $1,000,000. CD 11/6.

BUILDINGS—BA

† Va., Fort Eustis—HOUSING—BA 3/26—Purch. & Contg. Office, Fort Eustis, conversion 84 apartments to 42 apartments, Wherry Housing, IFB INVTC-44-019-59-157. CD 7/21.

† Alaska, Palmer—OFFICE—BA 3/30—U. S. Bureau Land Management, 226 Seward St., Juneau, office and quarters bldg., Proj. 59-28. Plans deposit $25.

▲† La., Lake Charles—HOUSING—BA 4/15—Base Procurement Office, Chennault Air Force Base, 300 housing units, Chennault Air Force Base. Former bids rejected. CD 7/7, under CA.

HEAVY CONSTRUCTION—LB & CA

▲ VIRGINIA—Commonwealth of Va., Dpt. Hys., 1221 E. Broad St., Richmond, Bids opened 3/4.

Va.—Walder & Flournoy, Inc., P. O. Box 775, Richmond, Va., LB $197,964 (17 bidders), 3 bridges beginning 0.587 mi. W. Int. Rte. 731, ending 2.489 mi. W. Int. Rte. 17 at Marshall, Rte. 66, Contr. 2, State Proj. 0066-030-001, B3, B4, B6, Fed. Proj. I-66-1 (8) 25, Contr. 2, Fauquier Co.;

Va.—Guy H. Lewis & Son, Box 128, McLean, Va. LB $790,623 (14 bidders), 8 bridges beginning Int. Rte. 29 and 211 E. of Gainesville, ending 0.391 mi. W. Int. Rte. 29 and 211, W. of Centreville, Rte. 66, Contr. 2, State Proj. 0066-076-101, B2, B3, B5, B6; 066, 029, 101, B5, B6, B7, B8, Fed. Proj. I-66-1 (6) 47; I-66-1 (5) 52, Prince William and Fairfax Counties;

Va.—Pendleton Constr. Corp., Box 549, Wytheville, Va., LB $935,011 (18 bidders), 6 bridges beginning 0.248 mi. S. Int. Rte. 611, ending 0.269 mi. N. Int. Rte. 11 and 58, Rte. 81, Contr. 2, State Proj. 0081-095-038, B10, B13, B14, B16, B19, B21, Fed. Proj. I-IG-81-1 (15) 14, Contr. 2, Washington Co. CD 2/10.

VIRGINIA—Commonwealth of Va., Dpt. Hys., 1221 E. Broad St., Richmond, Bids opened 3/4.

Va.—E. V. Williams Co., Inc., 1269 E. Princess Anne Rd., Norfolk, Va. and W. H. Scott, Box 418, Franklin, Va., LB $184,329 (4 bidders), 1.097 mi. 24 ft. x 8 in. c. conc. beginning Hampton Rds. tunnel approach ending 0.28 mi. E. Rte. 134 (Sinclair Circle) Rte. 258, State Proj. 0258-114-101, Fed. Proj. U-122-1 (10), City of Hampton;

Va.—Sam Findley, Inc., Box 2389, Roanoke, Va. LB $399,867 (8 bidders), 1.874 mi. 2-24 ft. x 7½ in. b. conc., bit. top beginning 3.931 mi. S. Int. Prop. Rte. 33, ending 2.057 mi. S. Int. Prop. Rte. 33, Rte. 81, Contr. 3, State Proj. 0081-082-017, Fed. Proj. I-202-3 (5), Rockingham Co.;

Va.—Donald H. Selvage, Amherst, Va. LB $97,957 (12 bidders) 0.734 mi. 16 ft. x 6 in. aggreg. base, bit. surf. treat. and bridge beginning bridge and approaches over Jonas Run ending Mountain Run 3.8 mi. from Brandy, Rte. 663, State Proj. 0063-023-015-016-021, Fed. Proj. S-215 (6), Culpeper Co. CD 2/10.

▲† Norfolk Dredging Co., Campostella Wharf, Norfolk, Va., CA $1,275,462, dredging (base approaches) U. S. Naval Base, NBy 15395, Spec. 15395/58, NORFOLK, VA. Dist. P. Wks. Office, 5th Naval Dist., Room 307, Bldg. N-26, Norfolk, Va. Bids Feb. 17. CD 2/26, under LB.

HARDWARE For HEAVY CONSTRUCTION

Hot Dip Galvanized or Black

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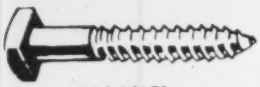
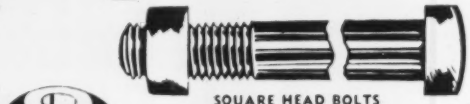
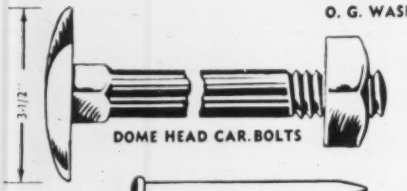


LAG BOLTS



SQUARE HEAD BOLTS

O. G. WASHERS



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▲ WEST VIRGINIA — State Road Comm., Charleston, Zone 5:

Mount Vernon Bridge Co., Sugar and Adams Sts., Mount Vernon, O., CA $2,258,900, steel superstructure and navigation lights, Martinsville Bridge No. 2042 on W. Va. Rte. 7 over Ohio River, Proj. S 47(3), Wetzel Co. Bids Feb. 24, awarded Mar. 4. CD 2/27, under LB.

▲ Ahl Brothers Constr. Co., 20 Dorman Rd., Wheeling, W. Va., LB $1,200,000 (2 bidders), Contr. 2, sewage disposal sys. (combination bids on both parts), WEIRTON, W. VA. City, City Hall, Weirton, W. Va. Bids Feb. 25. CD 10/10/57;
Mountain State Constr. Co., P. O. Box 296, Spring Hill, W. Va., LB $1,235,128 (2 bidders), Contr. 2, Part 1, 19,200 ft. interceptor sewers from filtration plant, through Steel Works to Cove Rd., (Weirton, W. Va.);
James White Constr. Co., Weirton, W. Va., LB $83,000 (3 bidders), Contr. 2, Part 2, interceptor line from Marland Heights through Half Moon Addn. to treatment plant, (Weirton, W. Va.);
McCarthy Constr. Co., 6th and Harriet St., Cincinnati, O., LB $427,600 (9 bidders), Contr. 3, 3,100 ft. tunnel from Kings Creek Bridge under Weircrest Hill to point near filtration plant, (Weirton, W. Va.).

† Chavis Constr. Co., 3107 N. Davis, Pensacola, Fla., CA $477,883, MISSILE FACILITIES, ENG-01-07e-59-62, EGLIN AIR FORCE BASE, FLA. U. S. Eng., P. O. Box 1169, Mobile, Ala. Bids Feb. 24. CD 3/3 under LB.

Caroline Park Estates Corp., c/o St. Johns Engineering & Survey Co., engrs., 108 W. Forsyth St., Jacksonville, Fla., rejected bids Feb. 20, sewage treatment plant, lines for Caroline Park Estates Subdivision, JACKSONVILLE, FLA. $150,000. CD 2/4.

Caroline Park Estates Corp., c/o St. Johns Engineering & Survey Co., engrs., 108 W. Forsyth St., Jacksonville, Fla., rejected bids Feb. 20, street paving for Carolina Park Estates Subdivision, JACKSONVILLE, FLA. $150,000. CD 2/4.

▲ Nichols Engineering & Research Corp., 70 Pine St., New York, N. Y., LB $1,371,000, incinerator (Coconut Grove) Jefferson St. and Washington Ave., MIAMI, FLA. City Comm., City Hall, Dinner Key, Miami, Fla. Bids Feb. 4. CD 1/9.

▲ E. M. Fleming Constr. Co., 4121 NW 25 St., Miami, Fla., LB $1,805,166, Item 1-C, Consumer Service and 20 Street Terminal Bldgs., International Airport MIAMI, FLA. Dade County Port Authority, 10th Floor Courthouse, Miami, Fla. Bids Mar. 3. CD 2/11.

† William M. Cowgur & Co., Inc., 721 Olive St., St. Louis, Mo., CA $230,547, small boat harbor and entrance channels at Dauphin Island, CIVENG-01-07e-59-47, ALABAMA, U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Feb. 24. CD 2/5.

Dunn Constr. Co., 201 N. Green Ave., Jackson, Miss., LB $213,399 (3 bidders), street work, incl. asphalt pave, grade, pave, drain, sanitary and street sewers, JACKSON, MISS. City, City Hall, Jackson, Miss. Bids Feb. 25. CD 2/5.

▲† Standard Dredging Corp., 80 Broad St., New York, N. Y., LB $1,064,497, dredging channel for Mississippi River-Gulf Outlet, GIWW to Bayou Dupre, Orleans and St. Bernard Parishes, Inv. No. 59-43, LOUISIANA, U. S. Eng., foot of Prytania St., New Orleans, La. Bids Mar. 3. CD 2/5.

BUILDINGS—LB & CA

▲ John McShain, Inc., 3501 Sinclair Lane, Baltimore, Md., LB $8,827,000 (8 bidders), AGRICULTURE-ENGINEERING PLANT, MORGANTOWN, W. VA. W. Va. University Bd. of Governors, Morgantown, W. Va. Bids Mar. 3. CD 2/3.

▲ Engstrom & Wynn, 1117 Chapline St., Wheeling, W. Va., CA $1,149,500, SCHOOL OF NURSING, WHEELING, W. VA. Ohio Valley General Hospital, 20th and 60th Sts., Wheeling, W. Va. Bids Feb. 18, awarded Feb. 26. CD 2/3.

▲ Kenneth Smith Constr. Co., 219 Magnolia Ave., Daytona Beach, Fla., CA $1,122,666, Pompano Beach HIGH SCHOOL, 1400 NE 4 St., FORT LAUDERDALE, FLA. Broward Co. Bd. P. Instruction, 1320 SW 4 St., Fort Lauderdale, Fla. Bids Feb. 11. CD 2/18, under LB.

▲ Daniel Constr. Co., Prudential Bldg., Jacksonville, Fla., LB $3,135,135 (10 bidders), 12,000-seat sports COLISEUM, JACKSONVILLE, FLA. City Comm., City Hall, Jacksonville, Fla. Bids Mar. 3. CD 2/6.

▲ The Glidden Co., Union Commerce Bldg., Cleveland 14, O., Owner Builds, $2,000,000, PLANT, JACKSONVILLE, FLA. CD 9/16.

▲ Crisp Manor, 648 Central Ave., St. Petersburg, Fla., Separate Contracts, $1,500,000, 123 RESIDENCES, ST. PETERSBURG, FLA. Smith & Gillespie, 1900 1st St. N., St. Petersburg, Fla., engrs.

▲ Kenneth Smith Constr. Co., 219 Magnolia Ave., Daytona Beach, Fla., LB $1,867,000, Base Bids 3 SCHOOLS' addns., Group No. 6, TITUSVILLE, FLA. Brevard Co. Bd. P. Instruction, Titusville, Fla. Gr[illegible] & Gomon, Municipal Airport, Daytona Beach, Fla., archts.

† Perusine Constr. Co., 1720 28 Ave., S. Birmingham, Ala., CA $85,954, 2 HARDSTANDS, for vehicular parking opposite Class and Laboratory Bldgs. 2, 3 and 4 in Ordnance Guided Missile School Area, Redstone Arsenal, ENG-01-07e-59-67, HUNTSVILLE, ALA. U.S. Eng., P. O. Box 1169, Mobile, Ala. Bids Mar. 10. CD 2/20.

† G. E. Bass & Co., Inc., 2715 N. State St., Jackson, Miss., LB $864,033 (7 bidders), ADMINISTRATION incl. alterations to Bldg. No. 1, Veterans Administra-

(Continued on page 212)

Famous

SALK HALL

at the University of Pittsburgh to be serviced by Ric-wiL underground piping . . .

Salk Hall is where Dr. Jonas E. Salk and his staff are conducting their continuous virus studies. This ten-story building will eventually become a center for experimental medicine with additional space for research conducted by many faculty members.

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Salk Hall and campus photo courtesy of University of Pittsburgh.

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IN CANADA: THE RIC-WIL COMPANY OF CANADA LIMITED

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(Continued from page 210)

tion Center, BILOXI, MISS. Veterans Admin.; Munitions Bldg., Wash., D. C. Bids Mar. 3. CD 1/19.

▲ **Howie Constr. Co.**, 720 Bratton St., Jackson, Miss., CA Est. $1,000,000, 7 story APARTMENT, JACKSON, MISS. Sterling Arms Corp., c/o contractor. Barlow & Plunkett, Jackson, Miss., archts.

▲ **H. B. Fowler Co.**, Harvey, La., CA, Inv. 6901, DC casting expansion site preparation, piping, plumbing, conduit, floor slab and equipment installation at PLANT, CHALMETTE, LA. Kaiser Aluminum & Chemical Corp., Chalmette, La. Bids Feb. 20. CD 2/10.

▲ **Johnson & Galyon, Contractors**, 422 Front St., Knoxville, Tenn., CA $3,192,837, AUDITORIUM-COLISEUM, KNOXVILLE, TENN. City, City Hall, Knoxville, Tenn. Bids Feb. 19, awarded Mar. 4. CD 2/26, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

† **Ill., Belleville**—LIGHTING—BA 3/26—General Services Admin., 575 U. S. Courthouse, Chicago, fluorescent lighting, air-conditioning, etc., for U. S. Post Office.

† **Ohio**—WARHEADING BLDGS.—BA 4/2—U. S. Eng., 237 4th Ave., Huntington, W. Va., warheading bldgs. for Special AAA Facilities, Cincinnati Defense Area, ENG-46-022-59-34B.

BUILDINGS—BA

▲ **Ill., Rockford**—SCHOOL—BA 3/24—Bd. Educ., 201 S. Madison St., high school, $3,100,000. Hubbard & Hyland, Gas Electric Bldg., archts. CD 2/4.

† **Ill., Great Lakes**—PROPELLER UNIT IMPRVS.—BA 3/25—Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1-A, fdns. for Propeller Unit Bldg. No. 309, Naval Training Center, Spec. 22299/59. Under $25,000. CD 9/8.

▲ **O., Willoughby**—HOSPITAL—BA 4/7—Lake County Memorial Hospital, Painesville, West Lake County unit of hospital. $4,750,000. Ellerbee & Co., E. First National Bank Bldg., St. Paul, Minn., archts. CD 3/19.

O., Cincinnati—SCHOOL—BA 4/15—Colerain Twp. School Dist., Poole Rd., elementary school. $750,000. Plans deposit $25. Sullivan, Isaacs, Sullivan, 1800 Reading Rd., Reading, archts. CD 11/10.

▲† **Mich., Dearborn**—BLDG. IMPRVS., etc.—BA 4/28—Veterans Admin., Munitions Bldg., Wash., D. C., Bldgs. 1-and 22 alterations, addns., incl. addnl. parking space for Veterans Administration Hospital. Smith, Hinchman & Grylls Assoc., Inc., 3107 W. Grand Blvd., Detroit, Zone 2, archt. CD 7/28.

HEAVY CONSTRUCTION—LB & CA

▲† **S. J. Groves & Son**, 19 Rector St., New York, N. Y., LB $25,216,379 (6 bidders), New Richmond Locks and Dam Proj., Ohio River near Chilo, O., CIVENG-46-022-59-42, OHIO and KENTUCKY. U. S. Eng., 237 4th Ave., Huntington 18, W. Va. Bids Mar. 5. CD 1/30.

National Constr. Co., 23500 Lakeland Blvd., Cleveland 23, O., LB $114,793, est. $200,000 (18 bidders), storm sewers, Section 1-B, EASTLAKE, O. City, City Hall, Eastlake, O. Bids Mar. 2. CD 2/18.

R. H. R. Constr. Co., Dover, O., LB $135,570, est. $190,000 (10 bidders), sanitary sewerage sys., for South Hills Section, MANSFIELD, O. City, City Hall, Mansfield, O. Bids Feb. 24. CD 2/18.

E. A. Bock Constr. Co., Inc., Meyer Rd., Fort Wayne, Ind., CA $444,602, interceptor sewer Y-Bridge jct. of Linden Ave. and sweeping northward, ZANESVILLE, O. City, City Hall, Zanesville, O. CD 5/15-56; **Mason Reed & Sheaf Co.**, 1758 Cleve. Columbus, O., CA $447,193, downtown sewerage sys., (Zanesville, O.).

▲ **INDIANA**—State Hy. Comn., State House Annex, Indianapolis. Zone 4.

A. L. Dougherty Co., 3333 Sheffield Ave., Hammond, Ind., CA $1,274,943, est. $1,315,305, rein.-con. paving 2.372 mi. US 31, SR 62, Proj. I-03-1(11), Contr. R-4396, Clark Co. Bids Aug. 26, awarded Feb. 12. CD 9/2, under LB.

ILLINOIS—State Toll Hy. Comn., 22 and Midwest Rds., Hinsdale. Bids opened 2-27.

Louis Scully & Sons, 6127 N. Hiawatha Ave., Chicago, Ill., LB $316,487 storm sewers, Butterfield Rd., Du Page Co. CD 2/10.

E. A. Meyer Constr. Co., Skokie Hy., Waukegan, Ill., LB $202,688, Contract B, sanitary and relief sewers, ZION, ILL. City of Zion, City Hall, Zion, Ill. Bids Feb. 26. CD 2/19.

E. A. Meyer Constr. Co., Skokie Hy., Waukegan Ill., LB $778,823, Contract A, bit. paving, concrete curb and gutters, storm sewers, ZION, ILL. City of Zion, City Hall, Zion, Ill. W. T. Hooper, 520 N. Western Ave., Lake Forest, Ill., engr. Bids Feb. 26. CD 2/12-57.

† **Erickson & Lindstrom Constr. Co.**, 310 Sill Bldg., Flint 2, Mich., CA $340,747, Schedule 3, control towers, incl. related work, Kinross Air Force Base, CD 3/12, and at Wurtsmith Air Force Base, Oscoda, CD 3/12, ENG-20-064-59-44, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit 31, Mich.

BUILDINGS—LB & CA

Alan Constr. Co., 830 Skokie Blvd., Northbrook, Ill., LB $536,851, general contract 2 story, 53,825 sq. ft. concrete floors, asphalt tile flooring Kinzie SCHOOL addns., alterations, CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Mar. 2. CD 2/11.

Van Etten Bros. Builders, Inc., 11024 S. Michigan Ave., Chicago, Ill., CA $750,000, 5 story, 51 x 69 ft. HOSPITAL addn., CHICAGO, ILL. Roseland Community Hospital, 45 W. 111 St., Chicago, Ill. Bids Feb. 26. CD 1/7.

▲ **Campbell Lowrie & Lautermilch**, 400 W. Madison St., Chicago, Ill., CA $3,500,000, LABORATORY addn., LABS, RESEARCH and OFFICE, 6 units, Waukegan Rd., south of Glenview Rd., GLENVIEW, ILL. National Dairy Products Corp., 75 E. Wacker Dr., Chicago, Ill. CD 3/4, under LB.

† **Fred B. Peterson Co.**, 1313 28 Ave., Moline, Ill., CA $464,212, rehabilitating BLDG. No. 350, Rock Island Arsenal, EN6-11-032-59-25, ROCK ISLAND, ILL. U. S. Eng., 475 Merchandise Mart, Chicago, Ill. Bids Feb. 19, awarded Feb. 27. CD 1/22.

▲ **Kroening Eng. Corp.**, 4500 W. Mitchell St., Milwaukee, Wis.; LB $1,598,700 (8 bidders), general contract Whitman JUNIOR HIGH SCHOOL, WAUWATOSA, WIS. Bd. Educ., 1732 Wauwatosa Ave., Wauwatosa, Wis. Bids Mar. 3. CD 2/3.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Minn., Faribault—BA 3/24—Rice Co., grading, grav. surf. 3 mi. between jct. TH 60, 4 mi. east of Faribault and jct. CSAH 19, 2 mi. south of Ruskin.

† **South Dakota**—BA 3/26—Bureau Reclamation, Dpt. Interior, Oral, earthwork and structures for open and closed drains for protection of Cheyenne River Siphon, Missouri River Basin Proj., Angostura Unit, Spec. 602C-24. CD 9/16/57.

† **Ark., Blytheville**—AIR BASE IMPRVS.—BA 3/27—Base procurement Office, Blytheville Air Force Base, modification Hangar Bldg. S-207, IFB-59-19; food inspection bldg., IFB-03-607-59-21, Blytheville Air Force Base. CD 9/10.

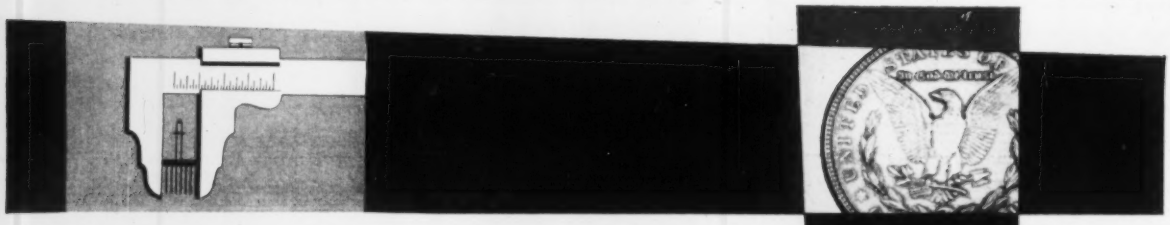
† **Ark., Blytheville**—AIR BASE IMPRVS.—BA 3/30—Base Procurement Office, Blytheville Air Force Base, modification Bldgs. 215, Administrative space and Shop, Blytheville Air Force Base, IFB-03-607-59-20. CD 9/10.

Minn., Glenwood—BA 4/1—Pope Co., CSAH 24, sand-grav. subbase, grav. base and road-mixed bit. surf. 2.2 mi. westerly from jct. TH 28 at Long Beach.

Minn., Waseca—BA 4/1—Waseca Co., CSAH 4, sand-grav. sub-base, grav. base, road-mixed bit. base and road-mixed bit. surf. 3.7 mi. between jct. CSAH 11, 1 mi. north and 3½ mi. east of Waldorf and point 8.3 mi. southwest of here; CSAH 5-5.4 mi. between point 6.7 mi. northwest of here and jct. CSAH 3, 0.1 mi. south of north county line.

† **N. M., Alamogordo**—STORAGE SUBSISTENCE BASE—BA About 4/16—U. S. Eng., P.O. Box 1538, Albuquerque, approx. 62x64 ft., concrete frame storage

(Continued on page 216)



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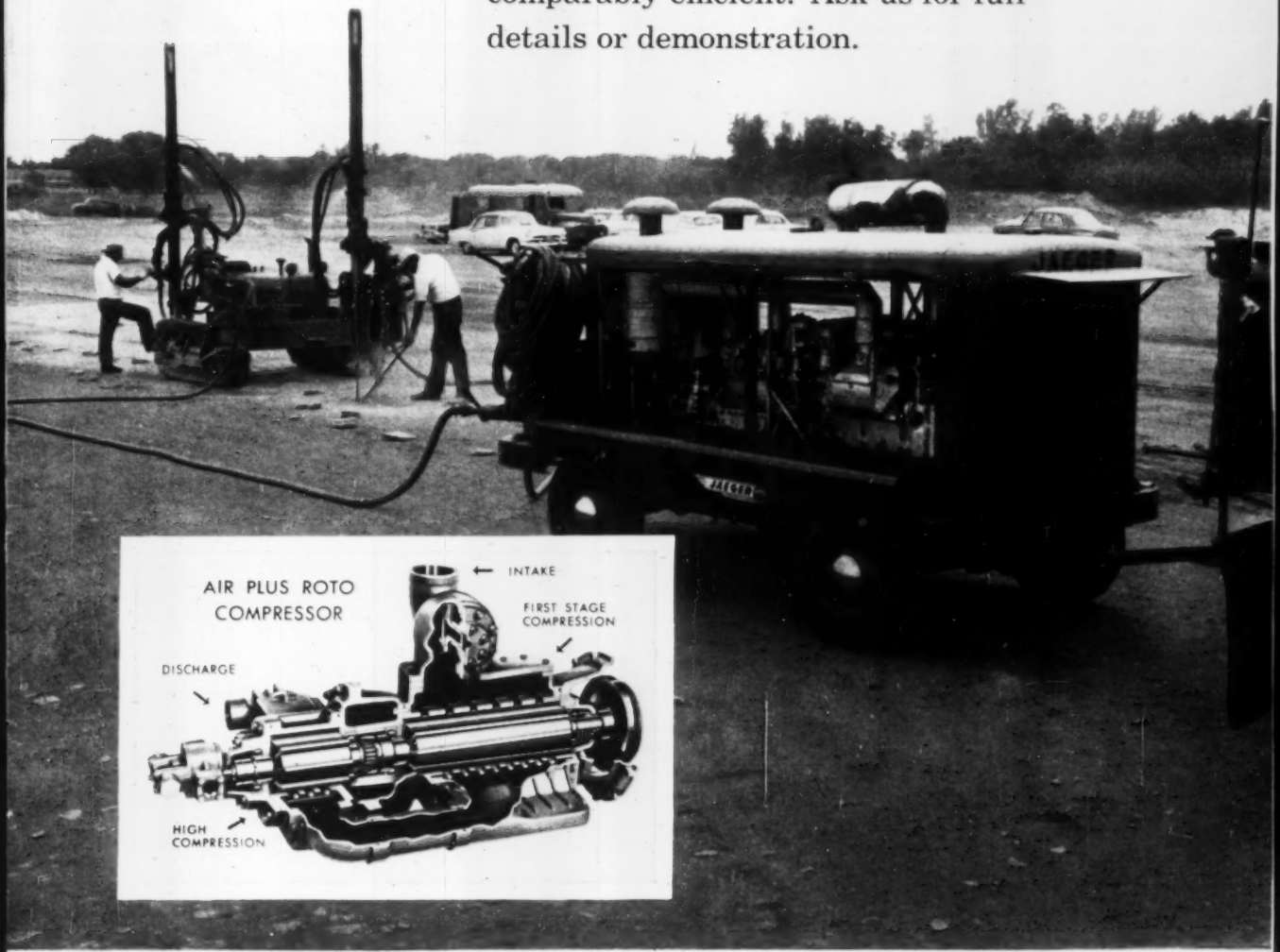
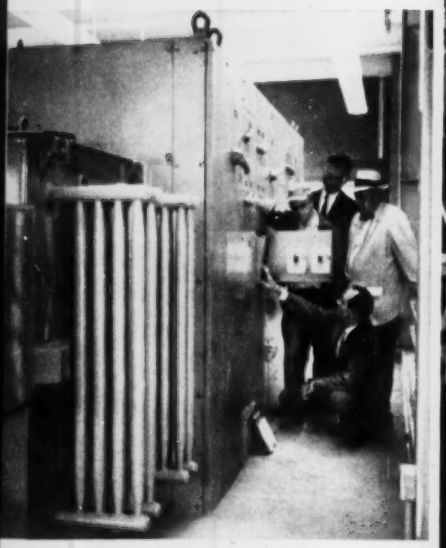
The engine of this Jaeger rotary is the same GM 6-71 diesel used in other "600" compressors. But the Jaeger compressor is so much more efficient it delivers full volume at 100 rpm slower speed (1700 rpm instead of 1800). Think what this means to you in engine life and fuel consumption. Jaeger 125, 250 and 365 rotaries are comparably efficient. Ask us for full details or demonstration.



DRILLING BLAST HOLES ON 3′ CENTERS for approximately 8000′ of 12″ to 42″ sewer requiring rock excavation, at Minneapolis Airport. Holes were 3″, drilled to 9′ depth. Peter Lametti Construction Co., contractor.

THE JAEGER MACHINE COMPANY
200 Dublin Ave., Columbus 16, Ohio

View from pump floor in Oswego, New York, pumping station showing one of main pumps being driven by Westinghouse 300-hp vertical synchronous motor above.



Robert B. Stannard, Resident Engineer for Nussbaumer, Clarke and Velzy, Consulting Engineers; Karr Parker, Jr., Buffalo Electric Co.; Kenneth D. Jensen, Superintendent, Department of Water, Oswego; and M. B. Trimble, Westinghouse Construction Sales Engineer, discuss "tilt-out, lock-out" feature of the control center. Westinghouse double-ended control power center has 300-kva Inerteen® transformer at each end.

Oswego water pumping station Powers-Up to attract new industries

The modernization and expansion program of the Department of Water, Oswego, N. Y., provides an interesting example of building today for tomorrow's needs. While planning for today, Oswego's Water Board recognized that a good water supply is an indispensable commodity in attracting new industry to the area. By Powering-Up electrically, their new pumping station has electrical capacity five times present demand to allow for future growth.

Present demands for water are approximately 10 million gallons per day. Installed pumping capacity is capable of providing more than 20 million gallons per day. In addition, provision has been made to increase capacity to 35 million gallons per day when required by future demands.

The new pumping station is supplied with lake water from an intake tunnel which extends through solid rock for a distance of 6250 feet into Lake Ontario. This tunnel intake averages eight feet in diameter and is capable of conveying 128 million gallons of water per day.

Electrical power for the station is available from two separate sources—one direct from the Oswego Steam Station and the other from the Niagara-Mohawk Varick Station. The complete electric distribution system, as furnished by Westinghouse, provides for all anticipated future expansion of the pumping station.

Powering-Up electrically for future growth can offer important advantages to you. For further information, call the Westinghouse electrical engineer nearest you, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-94119

Owner: Department of Water, Oswego, N. Y.
Consulting Engineers:
Nussbaumer, Clarke and Velzy
General Contractor: McElwee-Courbis Const. Co.
Electrical Subcontractor: Snyder and Mackin, Inc.
Westinghouse Distributor: Buffalo Electric Co., Inc.

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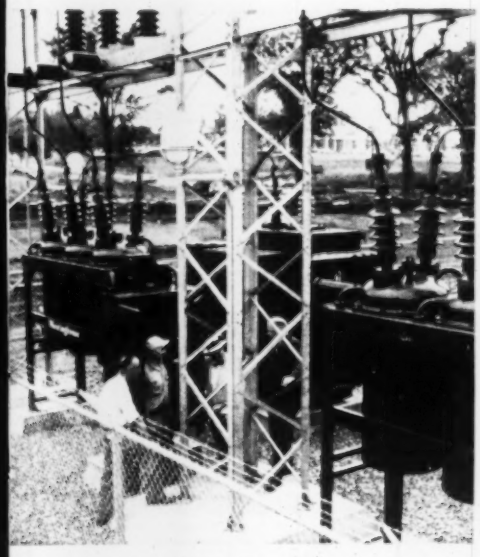


Leo J. Landrigan, Superintendent, Oswego Pumping Station; Richard C. Mansfield, Foreman for Snyder and Mackin, Electrical Contractors; Kenneth D. Jensen; and Charles T. Hansen, Westinghouse Sales Engineer, at outdoor substation which serves new Oswego pumping facility. Two Westinghouse 2000-kva power transformers and two Westinghouse 34.5-kv oil circuit breakers are included in this substation.

Main floor view in pumping station shows four Westinghouse vertical synchronous pump motors with the glass enclosed control room in background. The mezzanine floor above is occupied by Westinghouse 2300-v, heavy-duty, metal-clad switchgear, using Type DH air circuit breakers.

Another view of main floor shows reverse side of control room and, on the mezzanine, Westinghouse double-ended control power center. Floor openings in foreground, not shown, have been provided for the installation of four additional raw water pumping units when filter plant is added.

(Continued from page 212)

subsistence base bldg., incl. paving, rigid paving apron, electrical distr., water lines, and some spur track work. Holloman Air Force Base, ENG-29-005-59-105. CD 9/9.

BUILDINGS—BA

† N. M., Las Cruces—ELEVATED INSTRUMENTATION FACILITIES—BA 3/31—Purchasing & Contracting Div., White Sands Missile Range, elevated instrumentation facilities on Bldg. 1530, White Sands Missile Range, IFB ORD 29-040-59-41. CD 9/5.

Tex., Jefferson—SCHOOL—BA 3/31—Jefferson Ind. School Dist., masonry, concrete, steel Junior-Senior High School. $450,000. Plans deposit $50. Preston M. Geren, 1607 Fort Worth National Bldg., Fort Worth, archt. CD 2/30.

Colo., Littleton—SCHOOL—BA 3/26—School Dist. No. 5, 4801 S. Boston, 2 story, 37,000 sq. ft. Cherry Creek Senior High School addn. Over $400,000. Alfred Watts Grant & Assocs., 1640 Court Place, Denver, archts. CD 6/23.

Tex., Henderson—REA ADMINISTRATION—BA 4/7—Rusk Co. Electric Co-operative, 1 story, brick, tile concrete, steel, REA administration bldg. $150,000. Plans deposit $15. Preston M. Geren, 1607 Fort Worth National Bldg., Fort Worth, archt. CD 9/26.

† Tex., El Paso—G. M. RANGE TRAINING FACILITIES—BA 4/28—U. S. Eng., P.O. Box 1538, Albuquerque, N. M., G.M. range training facilities, Fort Bliss, ENG-29-005-59-998. CD 3/4.

BUILDINGS—SLC

▲ Colo., Englewood—PLANT—Garden Farm, Inc., Sealtest Foods, Div. of National Dairy Products, East 60 and Albion, Denver, soon lets contract 2 story, 42,000 sq. ft. dairy processing plant $1,000,000. Arthur F. Silver, 21 E. 46 St., New York, N. Y., archt. Joe Lort, 2111 Clayton, Denver, assoc. archt. Krey & Hunt, 292 Madison Ave., New York, N. Y. and J. Rupert Fooks, 745 S. Bryant, Denver, mechanical engrs.; Albert E. McKittrick, 973 Lincoln, Denver, electrical engr. CD 2/16.

Mo., St. Louis—CHURCH—Archdiocesan Bldg. Comm., 4396 Lindell Blvd., Zone 8, soon lets contract 133x155 ft. brick, stone, steel concrete church, 5801 Penrod Ave. for St. Joan of Arc Catholic Parish. Over $400,000. A. F. & Arthur Stauder, 3608 S. Grand Blvd., Zone 18, archts. CD 3/5/57.

HEAVY CONSTRUCTION—LB & CA

† Pioneer Industries, Inc., 2700 Hawkeye Dr., Sioux City, Iowa, CA $210,624, installation of SAGE ground air antenna farms at Finland Air Force Station and Wadena Air Force Station, PR-AMC-GEEIA-59-09, MINNESOTA. Base Procurement Officer, Tinker Air Force Base, Oklahoma City, Okla.

Village, Village Hall, New Hope (P.O. Minneapolis), Minn., received no bids Mar. 3, WW sys., incl. main trunk, main sub-trunks, elevated tank and tower, deep well, turbine pump, piping, pump house. NEW HOPE (P.O. MINNEAPOLIS), MINN. $350,000. Orr-Schelen, Inc., 3104 Currie Ave., Minneapolis, Minn., engr. Will re-advertise. CD 2/19.

▲† American Elin Corp., 11 Broadway, New York, N. Y., (Foreign Concern) LB $1,599,300, main Generator Unit 5 and 6, Bull Shoals Dam and Reservoir, White River, ARKANSAS. U. S. Eng., P.O. Box 867, Little Rock, Ark. Allis Chalmers Mfg. Co., 1992 Airways Blvd., Memphis, Tenn. (Domestic Concern) LB $1,796,432, second bidder. Bids Mar. 5. CD 1/28.

M & M Constr. Co., Healdton, Okla., CA $573,434, est. $1,890,000, water supply on Spring Creek, CHICKASHA, OKLA. City of Chickasha, City Hall, Chickasha, Okla. CD 10/18/55.

TEXAS—State Hy. Comn., Austin.

Gulf Bitulithic Co., 723 N. Drennan St., Houston, Tex., CA $789,540, embankment, cement stab. base, etc., Hy. I.H. 610, Proj. I 610 (22) 781, Harris Co. Bids Feb. 14. CD 2/19, under LB.

Central Texas Electric Co-operative, Inc., Fredericksburg, Tex., Owner Builds, $110,000, electric transmission lines conversion, Fredericksburg area, Gillespie Co., TEXAS. CD 9/4/57.

Telephone, Inc., 2501 Cedar Springs Rd., Dallas, Tex., Owner Builds, $110,000, rural pole telephone lines, Dallas area, Parker and Wichita Counties, TEXAS. CD 10/16.

Travis County, Comrs. Ct., Courthouse, Austin, Tex., Owner Builds, $100,000, general road maintenance and improvs., AUSTIN, TEX. CD 9/18.

Terry County, Courthouse, Brownfield, Tex., Owner Builds, $108,450, general road maintenance, BROWNFIELD, TEX.

City, City Hall, Bryan, Tex., Owner Builds, $60,000, c.i. water lines, BRYAN, TEX. CD 10/3.

Lewis & Lewis, 3800 S. University Dr., Fort Worth, Tex., LB $290,744 Alt. A, LB $328,394 Alt. B, assessment paving, various streets at 30 locations, FORT WORTH, TEX., City, City Hall, Fort Worth, Tex. Bids Mar. 3. CD 2/16.

City, City Hall, Freeport, Tex., Owner Builds, $60,000, storm levees, $70,000, open drainage (ditching), FREEPORT, TEX. CD 9/6.

Westwood Constr. Co., Box 8155, Denver, Colo., LB $231,872, est. $300,000, water filter plant addn., GREELEY, COLO. City, City Hall, Greeley, Colo. Bids Feb. 27. CD 1/27.

BUILDINGS—LB & CA

▲ Bor-Son Constr. Co., 1209 West 78th St., Minneapolis, Minn., LB $1,011,200 (19 bidders), general contract, STUDENT CENTER, NORTHFIELD, MINN. St. Olaf College, Northfield, Minn. Bids Mar. 3. CD 1/20.

Sampson Constr. Co., 1801 S. 9th St., Salina, Kan., CA Est. $160,000, 225,000 bu. GRAIN STORAGE ELEVATOR, PHILLIPSBURG, KAN. Phillipsburg Co-operative Assn., Phillipsburg, Kan.

Jarvis Constr. Co., 606 N. Front St., Salina, Kan., CA $472,364, est. $495,000, 1 story, brick veneer, concrete blocks HIGH SCHOOL, U. S. No. 77 north in Fairview Area, RILEY, KAN. Consolidated Rural High School Dist. Joint No. 8 of Riley Pottawatamie Counties, Riley, Kan. Anderson, Srack & Johnson, 1371½ S. Santa Fe St., Salina, Kan., archts. Bids Jan. 27. CD 11/20.

Bart Foster Constr. Co., north of city, Stillwater, Okla., CA $218,750, BLS-9 POWER PLANT extens., STILLWATER, OKLA. City of Stillwater, City Hall, Stillwater, Okla. Bids Feb. 23. CD 2/17.

▲ Stone & Webster Eng. Co., 49 Federal St., Boston, Mass., CA Est. $25,000,000, 1,000,000 kw structural steel PLANT, 750-acre site area, lighting, earth site work, water supply wells, intake and discharge canal, near Orange, BRIDGE CITY, TEX. Gulf States Utilities Co., 285 Liberty St., Beaumont, Tex. CD 1/23.

W. L. Wyman & Son, 1408 N. Atoll St., Dallas, Tex., Owner Builds, $400,000, SUBURBAN DEPARTMENT STORE, South Oak Cliff, DALLAS, TEX. CD 3/5.

Progressive Development, Inc., 200 Houston St., Fort Worth, Tex., Owner Builds, $850,000, 2 story, 153,750 sq. ft. floor space, brick, tile, concrete SHOP and OFFICE with roof deck parking for 225 cars, FORT WORTH, TEX. Preston M. Geren, 1607 Fort Worth National Bldg., Fort Worth, Tex., archt.

Thomas S. Byrne, Inc., Fort Worth National Bank Bldg., Fort Worth, Tex., CA Est. $750,000, Amon G. Carter MUSEUM of Western Art, Amon Carter Square, FORT WORTH, TEX. Amon G. Carter Foundation, c/o Jos. R. Pelich, superv. archt., Trans-American Life Bldg., Fort Worth, Tex. Philip Johnson, 375 Park Ave., New York, N. Y., archt.

Fretz Constr. Co., 2000 Eastwood St., Houston, Tex., CA Est. $375,000, MEAT PACKING PLANT, HOUSTON, TEX. Lone Star Packing Co., 812 Live Oak St., Houston, Tex. CD 12/12/57.

Natkin & Co., 6610 Supply Row, Houston, Tex., CA $110,000, refrigeration unit for meat packing plant (Houston, Tex.).

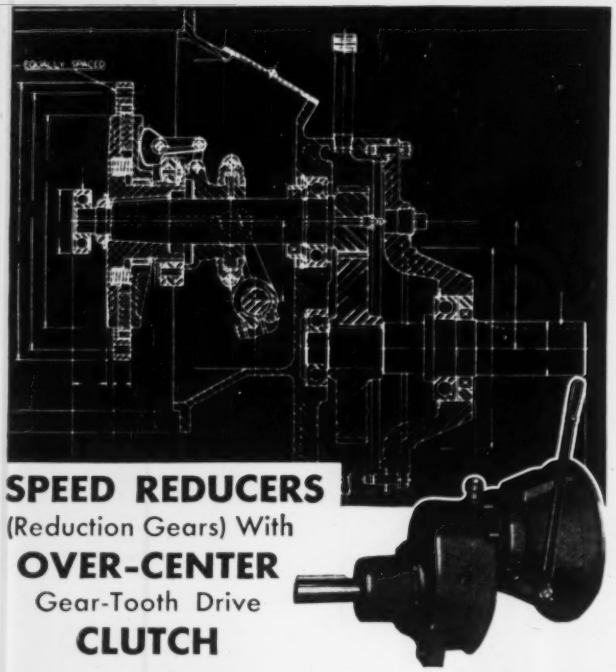
Al. J. Keller, Builder, 123 Hubbard St., San Antonio, Tex., Purchase and Hire, $409,750, 18 DWELLINGS, North Side, SAN ANTONIO, TEX. CD 2/27.

Lypta Co., 4602 Holmes Rd., Houston, Tex., Owner Builds, $200,000, PLANT, 10 acre tract Industrial Dist., near STAFFORD, TEX. CD 3/9.

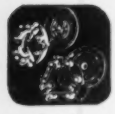
Dillon Constr. Co., 325 S. Main St., Pueblo, Colo., CA $550,500, est. $500,000, three 1 story, ELEMENTARY SCHOOLS: Boone, 104 x 206 ft.; North Mesa, 104 x 178 ft. and Vineland, 119 x 260 ft., PUEBLO, COLO. School Dist. No. 70, 29 Lane and Gale Rd., Pueblo, Colo. Bids Jan. 29; awarded Mar. 3. CD 2/9, under LB.

(Continued on page 218)

ROCKFORD

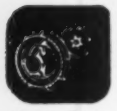


SPEED REDUCERS
(Reduction Gears) With
OVER-CENTER
Gear-Tooth Drive
CLUTCH


Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc


Heavy Duty Over Center

Power Take-Offs

Speed Reducers

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MACWHYTE WIRE ROPE

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(Continued from page 216)

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Arizona**—BA 4/7—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Whitlow Ranch Reservoir and earthfill dam, Gila River Basin, CIVENG-04-353-59-28. $2,500,000. CD 9/23.

† **Washington**—BA 4/14—U. S. Eng., City-County Airport, Walla Walla, intake gate hoists, Ice Harbor Dam, CIVENG-45-164-59-46. CD 9/19.

BUILDINGS—BA

† **Alaska, Big Delta**—OFFICE—BA 3/30—U. S. Bureau Land Management, 226 Seward St., Juneau office and quarters bldg., Proj. 59-29. Plans deposit $25.

BUILDINGS—SLC

▲ **Nev., Las Vegas**—HOTEL—Welton Beckett, archts., 5657 Wilshire Blvd., Los Angeles, Calif., soon lets contract 6 story rein.-con. Riviera Hotel Addn. for Riviera Hotel Corp. $1,000,000.

HEAVY CONSTRUCTION—LB & CA

WASHINGTON—State Hy. Comn., Dpt. Hys., Olympia, Bids opened 3/3,

S. S. Mullen, Inc., 646 Holgate St., Seattle, Wash., LB $366,151 (11 bidders) 2 precast prestressed concrete bridges, rein.-con. flat slab bridge, rein.-con. box girder 0.037 mi., Primary State Hy. 1, Pierce Co. line to junction with Primary State Hy. 5, King Co. CD 2/16.

† **Pelton Div. of Baldwin-Lima-Hamilton Corp.**, 2999 19th St., San Francisco, Calif., LB $308,982 (3 bidders) furnish governing equipment for three turbines in Ice Harbor powerhouse, Inv. 99-29, WASHINGTON, U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Mar. 3. CD 2/12.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 3/5,

Massey Sand & Rock Co. and Silva & Hill, Box 487, Indio, Calif., LB $1,757,460 (joint venture) (15 bidders), grade, surf. to constr. 9 mi. freeway, U. S. 60-70-99 between Indio and Thousand Palms, XI-Riv-26-E, Riverside Co. CD 1/28.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Calif.—**Guy F. Atkinson Corp.**, 10 W. Orange Ave., South San Francisco, Calif., CA $6,117,307, 7.8 mi. 4 and 6 lane freeway, U. S. Hy. 101 (San Diego Freeway) and U. S. Hy. 101 Alt. (Cabrillo Hy.) between Avenida Ramona in San Clemente and 1.4 mi. north of State Sign Rte. 74 in San Juan Capistrano, incl. 11 traffic separation structures and several interchange facilities, Orange and Los Angeles, Counties;

Calif.—**Frederickson & Kasler**, 212 13th St., Sacramento, Calif., CA $2,323,296, grading, paving to constr. 3.4 mi. 4 lane freeway and 4 structures U. S. 91, Sign Rte. 28 (Riverside Freeway) between Pierce St. and Van Buren St. in Riverside, incl. structures, and interchange facilities, Riverside Co. Bids Feb. 19, awarded Mar. 4. CD 2/24, under LB.

▲† **Bishop-Mattei Constr. Co., Inc.**, Pier 7, San Francisco, Calif., CA $1,288,060, two 1 story, 114,266 sq. ft., reinforced, frame, precast concrete composite structure addns., BEALE AIR FORCE BASE, CALIF., U. S. Eng., 1209 8th St., Sacramento 8, Calif. Bids Feb. 20. CD 2/26, under LB.

Alwood Corp., 203 E. Broadway, Glendale, Calif., CA $981,000, sanitary sewers, storm drains, filling and grading, Pacific Palisades High School, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro, Los Angeles, Calif. Bids Dec. 30. CD 2/2, under LB.

George Herz & Co., 2200 W. Base Line, San Bernardino, Calif., CA $547,673, Rialto Ave. Grade Separation, Spec. E-715, SAN BERNARDINO, CALIF., City, City Hall, San Bernardino, Calif. Bids Jan. 19.

Baldwin Contg. Co., 9th and Yuba Sts., Marysville, Calif., LB $99,981 (4 bidders), concrete storm drain and related work, portion Lynn Way, YUBA CITY, CALIF., City, City Hall, Yuba City, Calif. CD 3/22/56.

Geo. E. Berry, Beaverton, Ore., LB $135,754 (12 bidders) Gate alterations, repairs, The Dalles Dam, CIVENG-35-026-59-129, OREGON, U. S. Eng., Pittock Block, Portland, Ore. Bids Mar. 3. CD 2/4.

† **OREGON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland, Bids opened Mar. 3,

E. C. Hall Co., 11655 S.W. Barbur Blvd., Portland, Ore., LB $295,614, est. $371,847 (7 bidders) surf. 8.4 mi. Siuslaw River Rd., BLM-24B, Lane Co.

BUILDINGS—LB & CA

Bel Air Motel, Inc., Bellevue, Wash., c/o Campbell, Dawson & Assocs., archts., 11728 Aurora Ave., Seattle, Wash., Day Labor, $420,000, 50 unit RESORT MOTEL and RESTAURANT, Bellevue Airport, BELLEVUE, WASH.

▲† **U. S. Eng.**, 1519 S. Alaskan Way, Seattle 4, Wash., cancelled bids to have been opened Mar. 3, 64 unit frame Capehart family HOUSING, Inv. 59-54, Fairchild Air Force Base, SPOKANE, WASH. CD 1/29.

▲ **City**, 201 W. Main St., Alhambra, Calif., rejected bids Feb. 24, 2 story Type I 42,500 sq. ft. CITY HALL, ALHAMBRA, CALIF. LB $1,093,000. CD 2/27, under LB.

▲† **Barrett Constr. Co.**, 1800 Evans Ave., San Francisco, Calif., LB $1,028,000 (13 bidders) 48,000 sq. ft. steel frame FUEL ELEMENT LABORATORY BLDG., LIVERMORE, CALIF., U. S. Atomic Energy Comn., SF Operations Office, 518-17th St., Oakland, Calif.

▲ **Meyers Bros.**, 3407 San Fernando Rd., Los Angeles, Calif., LB $1,590,486, 2 and 3 story HOSPITAL BLDGS., PACOIMA, CALIF. Pacoima Memorial Lutheran Hospital, c/o Daniel, Mann, Johnson & Mendenhall, archts., 3325 Wilshire Blvd., Los Angeles, Calif. Bids Feb. 27. CD 2/16.

H. H. Henning & Son, 1751 Berkeley Ave., Stockton, Calif., LB $206,800 (3 bidders), two 1 story LAUNDRY addns., Stockton State Hospital, W. O. 4007GC-19, STOCKTON, CALIF. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids Mar. 3. CD 2/16.

CANADA

HEAVY CONSTRUCTION—BA

Man., Winnipeg—BA 4/22—City, City Hall, fabrication, erection steel superstructure overpass Red River Bridge, Disraeli project. $90,000. Plans deposit $10. CD 5/12/54.

PROPOSED PROJECTS

WATER SUPPLY

Colo., Strasburg—Town, Town Hall, water system study $150,000. Ken. R. White, 1567 Marion, Denver, consult. engr.

▲ **Ill., Chicago**—Dpt. Purchases, City Hall, WW, Southwest Pumping Station and equipment, 84th St. and Pulaski Rd., $4,000,000; 260 ft. brick radial smoke stack, Roseland Pumping Station, $175,000. Dick Van Gorp, 320 N. Clark St., Zone 10, ch. engr. Bids about end of 1959. CD 1/30/51.

Ky., Henderson—City, WW imprvs. $350,000. Stephen Watkins, 446 E. High St., Lexington, consult. engr. CD 1/4/55.

Minn., Litchfield—City, City Hall, water treatment plant. $250,000. R. J. Ellison, 2066 Bayard Ave., St. Paul, consult. engrs. Constr. 1959.

▲ **N. J., Trenton**—City, City Hall, 12 in. water mains, South Clinton and Pennington Aves., reconstr. 15 mi. trunk line, Trenton, 24-in. and 12-in. water mains, Parkway Ave., Scotch Rd., Ewing Twp.; water mains in White Horse-Mercerville Pike, Nottingham Way and Edinburg Rd., Hamilton Twp.; water mains, U. S. Rte. 1, Lawrence Twp., and 3 rmg.-water tanks, $1,650,000. Lewis Klockner, City Hall, engr.

▲ **N. Y., East Greenbush**—Town, Town Hall, water sys. $1,200,000. George C. Myrick & Assocs., 93 State St., Albany, N. Y., engrs. making survey of sources. CD 2/2.

Okla., Atoka—City, City Hall, voted bonds Feb. 17, WW exten. $151,500. R. W. Delaney, Ada, consult. engr. CD 8/7.

Okla., Elmore City—City, City Hall, voted bonds Feb. 24, WW sys. $134,000. Lee M. Bush & Co., Colcord Bldg., Oklahoma City, consult. engrs. CD 2/12.

▲ **Ore., Corvallis**—City, City Hall, voted bonds WW, reservoir and trunk lines, $1,400,000. V. L. Goodnight, c/o owner, engr.

▲ **Tex., Odessa**—City, City Hall, voted bonds Feb. 24, water lines, $760,000; water storage $125,000; water supply $200,000; WW sys. rehabilitation $115,000. CD 11/6.

Wis., Neenah—City, City Hall, 16 in. water main to serve northwest side, $150,000. W. Bryan, City engr.

Ont., Campbellford—Utilities Comm., Campbellford, water supply sys. $300,000. Canadian-British Engineering Consultants, 1662 Avenue Rd., Toronto, consult. engrs. CD 1/28/47.

Que., Ste. Coeur de Marie—Municipality of St. Coeur de Marie, water sys. renovation, $150,000.

SEWERS, WASTE DISPOSAL

▲ **Conn., Westport**—Town, Bd. Selectmen, Town Hall, plans by Whitman & Howard, 89 Broad St., Boston, Mass.; sewage disposal plant, $530,000; sewers and force mains, $645,000; sewage pumping station $110,000. CD 8/14.

Del., Laurel—City, City Hall, referendum Apr. 16, sewage treatment plant and interceptors, $623,390. Gardner & Sterling, Salisbury, Md., consult. engrs. CD 1/29/47.

▲ **Fla., Jacksonville**—City, City Hall, 3 sewage pumping stations, $3,000,000. Metcalf & Eddy, Statler Bldg., Boston, Mass., consult. engrs.

▲ **Ill., Urbana**—City, City Hall, bond election Apr. 7, storm sewers, $1,856,000. Clark Daily, Dietz, 211 Race St., consult. engrs. CD 1/28.

▲ **Ind., Gary**—Gary Sanitary Dist., City Hall, storm sewers in South Glen Park area, $2,000,000, 72 in. and 48 in. concrete sanitary sewers, Rhode Island St. U. S. Highway 12-20, 7th Ave., Main St., $700,000; sanitary sewers, Broadway Ave., south of 45th Ave. into Turkey Creek, $150,000. Hurst-Roche, Hillsboro, Ill., consult. engrs. on last 2 projects. Harold Zweig, City Hall, engr. CD 10/27/54.

Ind., Pierceton—Town, Town Hall, sanitary sewerage sys., incl. sewage disposal plant, storm sewers, sanitary sewers, $425,000. Clyde Williams Co., 312 W. Colfax Ave., South Bend, consult. engrs. Work to start in 1959.

Iowa, Nora Springs—City, City Hall, sewage treatment plant, $150,000, Wallace & Hollands, 401 N. Federal St., Mason City, engrs.

▲ **La., New Orleans**—City, City Hall, voted bonds Feb. 21, uptown incinerator, $1,000,000. CD 7/21.

Me., Skowhegan—Town, Bd. Selectmen, Town Hall, sewer and sewage treatment plant, $500,000.

Mass., Clinton—Town, 242 Church St., sewer constr. $250,000. Constr. 1959.

Minn., Wilmont—Village, Village Hall, complete sanitary sewerage sys. and sewage treatment plant, $100,000. R. J. Ellison, 2055 Bayard Ave., St. Paul, consult. engrs. Constr. 1959.

Miss., Aberdeen—City, City Hall, sewerage sys. imprvs., incl. sewage disposal plant, auxiliaries, appurtenances, $300,000. J. B. Converse & Co., Inc., Box 1084, Mobile, Ala., consult. engr.

Miss., Ocean Springs—Town, Town Hall, sewage disposal plant, $532,227.

N. Y., Syracuse—Onondaga P. Wks. Comn., Syracuse, sanitary sewer imprvs. Medford Rd., Ave. A, $103,700.

O., Akron—Comrs. Summit Co., Court House, trunk sewers to serve 3,794 acres, Macedonia, $600,000. Weinberg & Cunningham, 134 E. Thornton St., consult. engrs. CD 6/29/55.

O., Cincinnati—Bd. Comrs. Hamilton Co., Cities of Mt. Healty, N. College Hill, enlarging storm water culvert near Clovernook Ave., Mt. Healty, N. College Hill, $200,000.

Okla., Allen—City, City Hall, sewage disposal plant, sanitary main sewers, $100,000. R. W. Delaney, Ada, consult. engr. CD 3/3/52.

Okla., Vian—Town, Town Hall, sewer facilities, (PEL-V-34-121) $157,470. Watson Hall, 5601 Country Club Blvd., Little Rock, Ark., consult. engr.

Pa., Reading—Boro. of Kenhorst, Reading, sanitary sewers, sewage plant, $630,000. Walter E. Spotts & Assoc., 525 Elm St., consult. engrs.

Tex., Childress—Thaten Bros., c/o Pardue & Read, Proj. archts., 1901 10th St., Wichita Falls, sanitary storm sewers, $120,000.

Tex., Houston—Suburban Homes Realty & Lumber Co., 901 Little York Rd., sanitary sewers, $93,500; storm sewers, $90,000.

Tex., Odessa—City, City Hall, voted bonds Feb. 24, sanitary sewer lines, $250,000; sewage disposal unit, $95,000. CD 11/6.

Wash., Auburn—Federal Way Sewer Dist., sewerage sys. $600,000. H. T. Harstad & Assocs., 1000 Lenora St., Seattle, consult. engrs.

Wis., Superior—City, City Hall, sanitary sewers in Dist. No. 9, $175,432. E. W. Berg, city engr. CD 8/14/44.

Ont., Port Colborne—Town, Town Hall, sewage treatment plant, $530,000. Canadian-British Engineering Consultants, 1662 Avenue Rd., Toronto, consult. engrs.

▲ **Que., Cap Rouge**—Cap Rouge and nine other St. Charles River Valley Municipalities, c/o Town Hall, Cap Rouge, 10 mi. trunk sewer, $5,000,000. Marc Gilbert, 31 Rue McMahon, Quebec City, consult. engr. CD 6/5/56.

BRIDGES

Ind., Fort Wayne—Comrs. Allen Co., Courthouse, 4-lane bridge, 12 ft. lanes, approaches, sidewalks, replacing Stellhorn Bridge over St. Mary's River, $400,000. Zurbuch Engineers, Paramount Bldg., consult. engrs.

Wash., Spokane—Spokane Co., County Courthouse, reconstr. Sullivan Rd. overpass, spanning N.P. Ry. tracks and Trent, $120,000. W. Arrasmith, co. engr. Bids 1959.

▲ **Ont., London**—City Council, London, overpass at Canadian National Ry. tracks, Adelaide St., $1,200,000. K. Rountree, City Hall, engr.

STREETS AND ROADS

Calif., Los Angeles—City, City Hall, imprv. Normandie Ave., 48th to 52nd Sts., $100,000.

▲ **Colorado**—State Hy. Comm., Denver, plans 290 mi. Interstate Highway between Denver and the Utah line near Fort Cove.

Section 1: Denver to Empire Junction, Denver, Jefferson and Clear Creek Counties.

Section 2: Empire Junction to Detsere, Clear Creek, Summit and Eagle Counties.

Section 3: Empire Junction to Utah line, Eagle and Garfield Counties.

E. Lionel Pavie, 642 5 Ave., New York, 19, N. Y., consult. engr. will make a survey of section 2 to determine route.

May be a tunnel through the Continental Divide or a road through Straight Creek. LB under Unclass. 4/18/56.

▲ **Ill., Galesburg**—City, City Hall, wid'n., resurf. 2 sections Main St., Monmouth Blvd., and N. Henderson St., $1,000,000. Casler & Stapleton, Rte. 14 S., Crystal Lake, consult. engrs. CD 7/12/44.

▲ **La., New Orleans**—City, City Hall, voted bonds Feb. 21, paving of streets and drainage, $2,800,000. CD 12/16/55.

Minn., Caledonia—Houston Co., (1) grading and crushed rock surf. SP 28-608-02 (CSAH 3) 4.6 mi. southwest of TH 26 in Brownsdale $126,000, (2) grading crushed rock surf. and bridge 1.4 mi. west of Pine Creek, SP 28-610-02 (CSAH 6), $90,000. To go ahead this year.

▲ **N. Y., New York**—Manhattan Boro, Municipal Bldg., Zone 7, viaduct connections between Brooklyn Bridge and South Street Elevated Hy. together with ramp connections to Brooklyn Bridge and elevated hy. platform bulkhead on piles between Pier No. 19 and 21, East River; grading, curbing, sidewalks and paving with asphalt from Pearl St. to Park Row and from Pearl to Worth Sts.; grading, regrading, curbing, recurbing, sidewalks, paving and repaving with asphalt Pearl St. from Frankfort St. to Park Row; Gold St. from Spruce to Frankfort Sts.; Frankfort St. from William to Pearl Sts.; Dover St. from Pearl to Water Sts.; Madison St. from New to Pearl Sts.; Rose St. from Frankfort St. to Robert F. Wagner, Sr. Pl., $5,460,000.

OHIO—State Hy. Dpt., Columbus, Zone 15.

Darke Co.—straightening Jog in Rte. 49 between Pitts-

(Continued on page 220)

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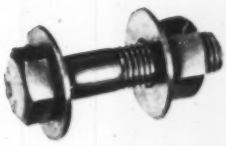

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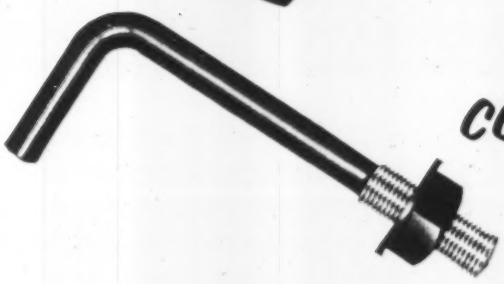

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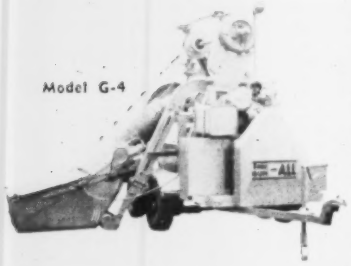

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(Continued from page 218)

burg-Laura Rds. and Delisle-Fourman Rds., Arcanum, $800,000.

O., Cincinnati—Murphy Bros., Inc., 7945 Hamilton Ave., concrete paving, sewer-water lines for first section of 400 home development, Plainfield-Glendale Milford Rd., $295,000. Constr. mid-May; concrete paving, sewer-water lines, second section, 130 homes, Plainfield, Glendale-Milford Rd., $295,000. Constr. late 1959; concrete paving, sewer-water lines, third section, 130 homes, Plainfield and Glendale-Milford Rd., $295,000. Constr. early 1960. Ayers & Graf, Linton St., engrs.

Pa., Levittown—Bristol Twp. Comm., Levittown, road rebuilding, Mill Creek Rd., etc. $438,000. William S. Erwin, c/o owner, twp. engr.

Tex., Beeville—Bee County Comrs. Court, road repairing, drainage, grading. $138,000. Constr. 1959.

Tex., Bryan—Brazos County, Courthouse, county-wide road work. $125,000. Constr. 1959.

Tex., Houston—City, City Hall, widening Memorial Drive from detering thru Memorial Park, $560,000, J. G. Turney, 2502 S. MacGregor St., consult. engrs; exten. Bellfort St., Telephone Rd. to Gulf Freeway, $288,560, Wendell Beard, Rusk Bldg., consult. engrs. CD 1/29/58.

▲ Tex., Odessa—City, City Hall, voted bonds Feb. 24, street paving extens. $1,000,000; streets reworking, reconditioning, $455,000. CD 11/6.

Wash., Spokane—Spokane Co., Co. Courthouse, rebuilding 4 mi. Elder Rd. $120,000. W. Arrasmith, co. engr. Bids to be called this year.

▲ QUEBEC—Provincial Roads Dpt., Parliament Bldgs., Quebec City.

Cap de la Madeleine—road from Hy. 19 south to junction of Ste. Madeleine and Notre Dame Sts. $1,000,000.

Que., Three Rivers—City, City Hall, wid'n. Ste. Marie St. $100,000. CD 10/16/56.

EARTHWORK, WATERWAYS

† California—U. S. Eng., 1209 8th St., Sacramento, highway relocation, Hogan Dam Proj., $500,000. Charles O. Greenwood, Jr., 2321 21st., Sacramento, consult. engr. CD 9/23.

O., Grove City—Village, Grant Run Drainage Ditch impry. to serve 1,118 acres between Holt and Stringtown Rds. $369,549.

AIRPORTS

▲† Ala., Montgomery—DWELLINGS—Procurement Office, Gunter Air Force Base, plans by Pearson, Tittle & Narrows, First National Bank Bldg., rehabilitate 154 dwellings, Gunter Air Force Base, $1,155,000.

† Ala., Montgomery—DWELLINGS—Procurement Office, Maxwell Air Force Base, plans by Pearson, Tittle & Narrows, First National Bank Bldg., rehabilitate 121 dwelling units at Maxwell Air Force Base, $907,000.

▲ Colo., Denver—AIR FIELD IMPRVS.—City and County of Denver, City and County Bldg., $20,000,000 bond election May 19, Stapleton Airport imprvs. James E. Burkley, 30 E. 40 St., New York, N. Y., and Ken R. White, 1567 Marion, Denver, consult. engrs. CD 9/4/57.

▲ Ill., Chicago—HANGARS, etc.—Dpt. Purchase, City Hall, plans by Naess & Murphy, 80 E. Jackson Blvd., Zone 4.

2nd hangar, O'Hare Field, $5,000,000, Ragner, Bensen & Co., 4744 W. Rice St., consult. engrs.

plans by Naess & Murphy, archts.-consult. engrs., 80 E. Jackson Blvd., Zone 4, on following projects, 1st hangar, O'Hare Field, $5,000,000.

grading terminal-hangar areas, $3,000,000.

30 in. water line, reservoir, sewage facilities, storm and sanitary sewers, O'Hare Field, $3,500,000.

apron paving in terminal area, $3,000,000, parking lots $3,000,000, O'Hare Airport.

2½ story, 200x700 ft. 2nd and 3rd terminal bldgs., O'Hare Airport, $20,000,000; CD 12/3/57.

▲ La., New Orleans—AIRPORT IMPRVS.—City, City Hall, voted bonds Feb. 21, addnl. imprvs. at Moisant Airport, $1,000,000.

† Minn., Wadena—ELECTRICAL DISTR. and POWER—U. S. Eng., 1217, U. S. Post Office and Custom House, St. Paul, elec. distr. and power, Air Force Station. Under $500,000. Bids in April.

N. H., Portsmouth—TERMINAL BLDG., etc.—State N. H. Aeronautics Div., State House, Concord. Terminal Bldg., taxiways and aprons, Sherburne Rd. between Witmer & Sutton Aves. at airport, $500,000.

Tex., Houston—AVIATION CENTER—Cruse Aviation, Inc., 8246 Travelair St., 1 stop aviation center, incl. hangar and concrete ramp tie down facilities for 75 light planes, $325,000. Rob't E. Nesmith, 6738 Long Dr., Houston, consult. engrs. CD 5/4/57.

▲† Vt., Winooski—BOMARC MISSILE LAUNCHING SITE—U. S. Eng., 424 Trapelo Rd., Waltham, Mass., bomarc missile launching site, Ethan Allen Air Force Base, $3,000,000. Fay, Spofford & Thorndike, Inc., 11 Beacon St., Boston, Mass., consult. engr.

Wis., Oshkosh—AIRPORT IMPRVS.—Winnebago Co., plans by Anler, Dreger, Wiley & Wertsch, Inc., 105 Washington St., airport imprvs., incl. tower, roads, utilities, taxiway, $303,200. Bids in June.

Wyo., Cheyenne—TERMINAL—City, City Hall, plans by Robert W. Phelin, 2838 Kelley Dr., 16,000 sq. ft., hyperbolic paraboloid, split level airport terminal bldg., $400,000. Volk & Harrison, 2305 Oxford Lane, Casper, structural engr. J. A. Begonia, Jr., 2307 Oxford Lane, Casper, mechanical engr. Miner & Miner Consulting Engrs., 905 16 St., Greeley, elec. engrs. CD 7/23.

LATIN AMERICA

▲ Venezuela—CRUDE LINES—Mende Grande Oil Co., Caracas, 24 mi. 16 in. crude line Zarza to Zulus, and 12 mi. 24 in. crude lines West Guara to Oficina, 5 mi. 24 in. near Melones, $1,090,000. Constr. 1959.

AMERICANS ABROAD

▲ B. W. I., Jamaica—OIL REFINERY—Esso Standard Oil, S.A. (Esso Standard Oil Co.) 15 W. 51 St., New York, N. Y., U.S.A., 26,000 bbls. per day oil refinery, $18,000,000-$20,000,000.

FOREIGN

▲ Greece—AIR DEFENSE—General Air Staff, Public Work Directorate, 9 Lycurgus St., Athens, 8 areas, architectural, civil and electrical engineering works, air defense project. Over $3,600,000. Bid document available Mar. 14 to eligible firms in accordance with security regulations on classified documents.

PUBLIC BUILDINGS

▲ Calif., Berkeley—CHEMISTRY—Bd. Regents, University of California, plans by Anshen & Allen, 461 Bush St., San Francisco, 8 story rein.-con. chemistry bldg., Berkeley Campus, $4,500,000.

Calif., Fillmore—SCHOOLS—Fillmore High School Dist., Fillmore, voted $519,000 bonds Feb. 24, schools. CD 1/26.

Calif., La Puente—SCHOOL—Rowland Union School Dist., 18613 Pacato Rd., plans by Lee B. Kline, 963 W. Colorado Blvd., Los Angeles, reinforced brick Grandview School, $500,000. CD 2/26.

▲ Calif., Pittsburg—SCHOOL—Pittsburg Unif. School Dist., 2000 Railroad Ave., plans by Beland & Gianelli, 1221 Monterey St., Vallejo, elementary school, near Railroad Ave. $1,519,000. CD 5/25/56.

Calif., San Gabriel—SCHOOL—Richard Garvey School Dist., 7661 E. Newmark St., voted bonds Feb. 24, school, $400,000. CD 1/16.

Colo., Aurora—YOUTH CENTER—City, 9559 East 16 Ave., youth center, incl. swimming pool, $500,000-$700,000.

▲† Colo., Fort Carson—BARRACKS—U. S. Eng., 1709 Jackson, Omaha, Neb., 3 enlisted men's barracks, North end of parade ground facing O'Connell, $2,090,000; 13 igloos for underground ammunition storage, $503,000. CD 7/1/57, under LB.

Colo., Gunnison—SCHOOL—Bd. Educ., Gunnison County, plans by Wheeler & Lewis, 2215 W. 32 Ave., Denver, County High School, $400,000.

Conn., Bethel—SCHOOL—Town, Town Hall, elementary school, Stony Hill, $400,000.

Conn., Branford—SCHOOL—Town, Town Hall, Junior High School, $400,000.

▲† Conn., Hartford—FEDERAL OFFICE—General Services Admin., 19 and F Sts. N.W., Wash., D. C., plans by Douglas Orr, 111 Whitney Ave., New Haven, and Ebbets, Frid & Prentice, 892 Asylum Ave., Hartford, 295,000 sq. ft. air conditioned federal office bldg., Main St., $8,500,000. Paul D. Bemis, 36 Pearl St., consult. engr. Henry A. Pfisterer, 111 Whitney Ave., New Haven, structural engr. CD 9/24.

▲ Conn., Middletown—SCHOOL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Seb. J. Passanesi, 164 Court St., Vinal Regional Technical School, Daniels St., $1,700,000. Wm. J. Carson, 99 Mountain Rd., West Hartford, consult. engr. Fred S. Dubin Assocs., 178 S. Whitney St., Hartford, structural engrs. CD 2/17.

Conn., New Haven—SCHOOL—Town, Bd. Educ., City Hall, plans by Skidmore, Owings & Merrill, 425 Park Ave., New York, N. Y., elementary school, Wooster Sq. Redevelopment Area, $500,000. Schilling & Goldbecker, 18 Trumbull St., assoc. archts. CD 6/23.

Conn., Weston—SCHOOL—Town, Town Hall, plans by Gilroy & Gaydosh, 64 Wall St., Norwalk, Junior High School, Lord's Highway, $950,000.

Conn., Woodbury—SCHOOL—Town, Town Hall, elementary school to replace Mitchell School, $495,600.

Del., Stockley—LAUNDRY—Delaware State Hospital for The Retarded, Stockley, laundry, $125,000.

▲ Ga., Atlanta—HEALTH CENTER—Fulton Co. Comrs., Roads & Revenues, County Admin. Bldg., plans by McDonald & Co. Assocs., 41 Exchange Pl., S. E., central health bldgs., Butler and Gilmer Sts. $1,300,000. CD 10/23.

▲ Ill., Chicago—HOSPITAL—Bd. Comrs. Cook Co., County Bldg., plans by Richard W. Prendergast, 30 N. Dearborn St., remodel Men's and Children's Hospital, $1,300,000; remodel power house, laboratory and morgue, $1,380,000; tunnel to morgue laboratory, $255,000, all above work at Cook County Hospital, Wood and Harrison Sts. CD 6/11/57.

Ill., Chicago—HOSPITAL—State of Illinois, State Office Bldg., Springfield, plans by Schmidt, Garden & Ericson, 104 S. Michigan Ave., University of Illinois Hospital laundry, 840 S. Wood St., $500,000. CD 11/2/50.

▲ Ill., Deerfield—SCHOOL—Deerfield Public Schools, Deerfield Rd., plans by Loebl Schlossman & Bennett, 333 N. Michigan Ave., 1 story high school, $3,500,000. Bids in Spring.

Ill., Waukegan—City, City Hall, sewage treatment plant, transmission pipe lines, $650,000. E. H. Black Engineering Co., 1321 Glen Rock Aves., consult. engr. CD 2/26/54.

Iowa, Holstein—SCHOOL—Bd. Educ., Community School Dist., voted $450,000 bonds Feb. 5, Junior-Senior

(Continued on page 224)

UNIT takes a big bite!

Swings and Dumps FAST

Operator can SEE what he's doing at all times!

• Here is one of many contractors who prefer the UNIT 513C Challenger for handling bulk material. The pictures show the machine removing and loading used carbide slack from the pit of a large chemical plant. Equipped with ½ yard clamshell bucket, the 513C takes a big bite, swings and dumps fast. Output averages about 30 yards per hour. Hydraulic clutches, and easy-to-reach levers, simplify the machine operation. And the safety-promoting FULL VISION CAB enables the operator to SEE what he is doing at all times. Get all the facts. Write for Bulletin.

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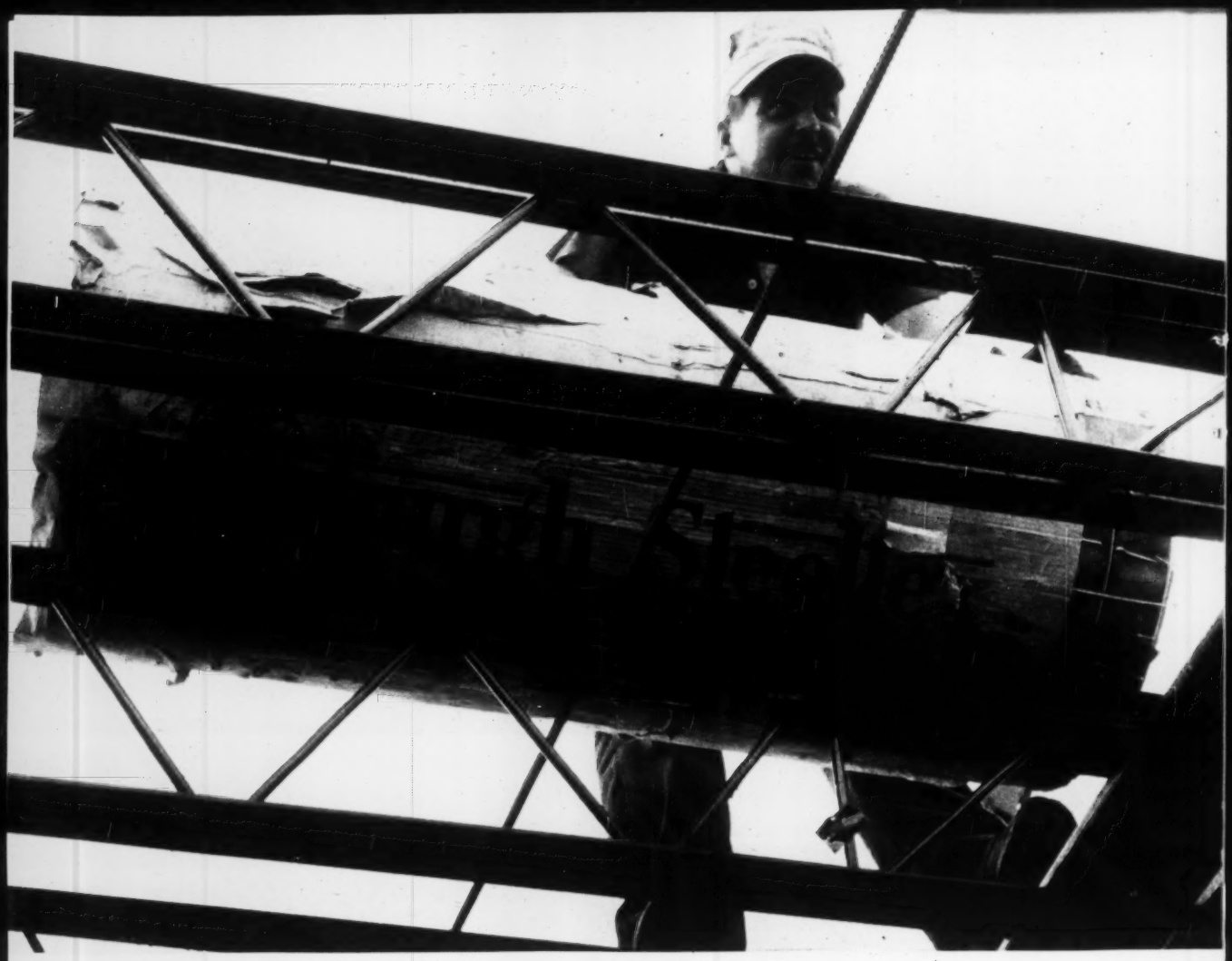


Steeltex Saves $10,000 And 24 Working Days

Architect Cites Double-Duty Package—Form And Reinforcing; Contractor Likes Economy, Versatility Of Pittsburgh Steel Company's Steeltex In Luxurious $1.5 Million Apartment-Hotel

Double-barreled savings—$10,000 on cost of material and 24 working days—came through use of Steeltex in constructing the $1.5 million Presidential Apartment-Hotel in Evanston, Ill.

Steeltex—the wire mesh reinforcing that carries its waterproofed form on its back—provided form and reinforcing for 100,000 square feet of concrete slabs covering seven floors and roof of the luxurious apartment-hotel.

Steeltex from Pittsburgh Steel Products Division of Pittsburgh Steel Company was the logical choice for the job, according to Architect Kenneth R. Woods, AIA, and Frederick A. Thulin Jr., AIA.

Mr. Woods and Mr. Thulin are principals of Thulin, Woods & Isensee, Inc., Chicago architectural firm which designed the building. Structural Engineer Herbert M. Miller was consulting engineer for the project. Said Architect Woods:

"I believe Steeltex is the only product of its type for supporting concrete over joists—in this case a two-inch slab with joists on two-foot centers.

"Steeltex' big advantage is that everything comes in one package—the form provided by the waterproofed paper and the reinforcing provided by the wire mesh which embeds itself into the concrete."

• **Appreciates Economy**—Leonard C. Tharnstrom, president of C. A. Tharnstrom & Co. of Skokie, Ill., general contractor, appreciated Steeltex' economy.

"I estimate we saved about 10 cents per square foot on this job by using Steeltex instead of another material."

Steeltex cuts easily and fits quickly around protruding steel column. Said James R. Huiras, field superintendent for subcontractor: "It took three men only three days to install 12,000 square feet of Steeltex on each floor. Sheet material would have taken twice as much time and required an extra man."

Ready for pouring, Steeltex placed snugly around column is examined by (kneeling) Leonard C. Tharnstrom, president of C. A. Tharnstrom & Co., general contractor; Architect Kenneth R. Woods of Thulin, Woods & Isensee, Inc., and (standing) Pittsburgh Steel Products Salesman William L. Dolan. Mr. Tharnstrom estimated his firm "saved about 10 cents a square foot by using Steeltex instead of other material."

"On top of that," Mr. Tharnstrom added, "Steeltex brought savings with a minimum loss of concrete because the paper reduces the amount of concrete drippage to the floor below."

Another built-in Steeltex advantage —ease of handling and installation— received enthusiastic approval from workmen who installed the Steeltex.

James R. Huiras, field superintendent for sub-contractor Bo-An Steel Erecting Co., Chicago, has used Steeltex many times on various types of construction.

• **Likes Steeltex' Speed**—Speed of installation rates number one on the list of advantages outlined by Mr. Huiras.

"It took three men only three days to install 12,000 square feet of Steeltex on each floor of this building," declared Mr. Huiras. "A sheet material would have taken twice as much time and required an extra man.

"What helped us make such a fast installation was Steeltex' light weight and easy handling. It's easily unrolled, cut to length, tightened and clipped. Men can walk on Steeltex while new sections are laid, too.

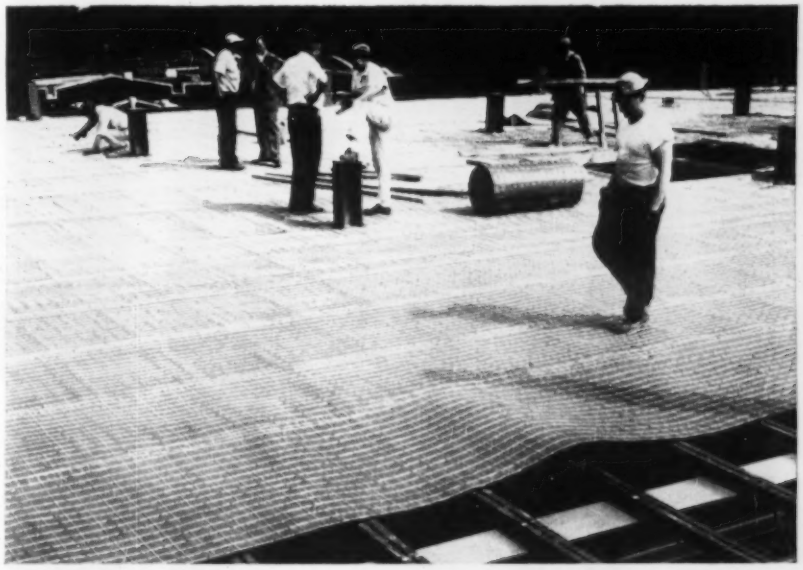
"Another good point is that Steeltex fits tightly around columns. It takes only a few minutes to cut Steeltex to fit. After that, you can pour right away."

All the built-in advantages of Steeltex and more—sales engineers to help solve your construction problems—can be put to work for you, too.

How? Just call the nearest Pittsburgh Steel Products district sales office.

See locations at right.

Let Steeltex help provide better construction at substantial savings for you. Call today . . . tomorrow you'll be glad you did.



Continuous reinforcing of Steeltex from section to section with a minimum of side lapping and end lapping cuts costs and speeds installation. Heavy waterproofed paper provides form, prevents drip-through. Wire mesh embedded in concrete gives uniform reinforcing.

▶ **See Sweets Catalog Section 2-B**

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		Houston	Philadelphia	Warren, Ohio

(Continued from page 220)

High School. Karl Keffer Assocs., 202 Masonic Temple Bldg., Des Moines, archts:

▲ **La., Gretna**—SCHOOLS—Jefferson Parish School Bd., 519 Huey Long Ave., voted bonds Feb. 21, schools $10,704,595.

Md., Ellicott City—SCHOOL—Howard Co. Bd. Educ., Ellicott City, plans by Johannes & Murray, 855 Pershing Dr., Silver Spring, Howard Co. High School addn. $450,000.

† **Md., Indian Head**—PROPELLANT PLANT—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., propellant plant. $6,500,000 (no appropriation). Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del., consult. engr.

Mass., Peabody—SCHOOL—City, City Hall, plans by John M. Gray Co., 153 Milk St., Boston, elementary school, Bow St., West Peabody Section. $500,000. Constr. 1959.

Mass., Springfield—OFFICE—City, Water Dpt., City Hall, plans by V. Caolo Assoc., archts.-engrs., 1562 Main St., 2 or 3 story office. $400,000. Constr. 1959.

Mass., Williamstown—SCHOOL—Town Williamstown and Lanesboro, School St., Williamstown, plans by Alderman & MacNeish, archts.-engrs., 594 Riverdale Ave., West Springfield, Regional High School, South Williamstown. $800,000. Constr. 1959.

Mass., Worcester—HOUSING FOR THE ELDERLY—City Housing Auth., 68 Tacoma St., plans by C. W. Buckley, Inc., 311 Main St., Proj. 12-2-housing for the elderly, May St. $400,000. Constr. 1959.

Mass., Worcester—SCHOOLS—City, City Hall, plans by Albert J. Roy, 120 Front St., elementary school, Mower St., $400,000, CD 12-20; plans by O. E. Nault & Sons, 48 Hamilton St., elementary school, Great Brook Valley Gardens, $540,000.

▲ **Mich., Detroit**—SCHOOLS—City, City Hall, $60,000,000 bond election Apr. 6; schools. (Total to be raised is $90,000,000 to be issued over 25-year period).

▲ **Minn., Minneapolis**—SCHOOLS—Bd. Educ. plans by S. C. Smiley & Assocs., 1750 Hennepin Ave., Harrison grade school addn.; James and Fourth Aves. North, $900,000, CD 6-6; plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Minn., Northeast Junior High School addn., 2955 NE Hayes St., $400,000. Constr. 1959.

▲ **Minn., Richfield (P. O. Minneapolis)**—SCHOOL—Bd. Educ., voted $2,600,000 bonds Feb. 26, high school, 75th St. and Oliver Ave. S. Thorshov & Cerny, Inc., 400 Metropolitan Bldg., Minneapolis, archts. Constr. 1959. CD 1-28.

Minn., Rosemount—SCHOOL—Bd. Educ. School Dist. No. 196, defeated $790,000 bonds Feb. 24, elementary school and high school expansion. CD 1-29.

Miss., Pascagoula—HOSPITAL—Bd. Supervs. Jackson Co., plans by Carl Olscher, Pere Marquette Bldg., New Orleans, La., 3 story, brick, concrete, masonry 60-bed hospital addn. $677,399. Bids in April.

Mo., Crestwood (St. Louis 22 P.O.)—RECREATION CENTER, etc.—City, City Hall, 1495 S. Sappington Rd., Zone 22, defeated $450,000 bonds Feb. 24, recreation center, incl. swim pool, picnic facilities, etc. Erwin Carl Schmidt, 9430 Manchester Rd., Webster Groves, Zone 19, archt. CD 1-27.

▲ **Mo., Kirkwood (St. Louis 22 P.O.)**—SCHOOLS—Kirkwood School Dist. R-7, Bd. Dirs., 516 S. Kirkwood Rd., Zone 22, voted $1,000,000 bonds Feb. 24, Nipher Junior High School addn., North Kirkwood Junior High School, Rose Hill elementary school and alterations, etc. to 11 schools. CD 1-27.

▲ **Mo., Maplewood (St. Louis 17 P.O.)**—SCHOOLS—Maplewood-Richmond Heights School Dist., 7539 Manchester Ave., Zone 17, defeated $1,275,000 bonds Feb. 24, school imprvs., incl. Sutton School addn., Senior High, West Richmond School and Junior High School addn. CD 2-11.

▲ **Mont., Great Falls**—SCHOOL—Cascade County School Dist. No. 1, Great Falls, bond election Apr. 4, 5 elementary schools on sites already owned by district. $3,307,500. CD 10-15.

▲ **Mont., Missoula**—SCHOOLS—Missoula County School Dist. No. 1, $1,750,000 bond election Apr. 4, schools. CD 4-14.

N. H., Farmington—SCHOOL—Town, School Supt., plans by Irving W. Hersey Assoc., Town Hall Bldg., Durham, high school. $700,000, Constr. 1959.

N. J., Irvington—HOUSING—Town of Irvington Housing Auth., plans by George T. Hechtel, 1039 Springfield Ave., 48 unit public housing, Union Ave. adjoining Comptown Gardens, Proj. NJ-37-B. $750,000. CD 7-28.

▲ **N. J., Morristown**—SCHOOL—Bd. Educ., Morris Twp., election to authorize project and issue bonds May 12, high school, Lake Rd. $2,650,000. Epple & Seaman, 901 Broad St., Newark, archts. CD 2-26-58.

New York—CENTRAL FIRE COMMUNICATIONS—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Proj. F-2, Central Fire Communications Bldg. for Fire Department, Richmond Boro. $495,000. Syska & Hennessy, Inc., 144 E. 39th St., New York 16, N. Y., engr. To go ahead 1959.

N. Y., Auburn—COUNTY JAIL—Bd. Supervs. Cayuga Co., Court House, county jail. $600,000.

▲ **N. Y., Brooklyn**—SCHOOL—Bureau Constr., Bd. Educ., 45-12 Crescent St., Long Island City, plans by Schulman & Soloway, 161-10 Jamaica Ave., Jamaica, Proj. E-625, P.S. 29, conversion and modernization. $1,000,000.

▲ **N. Y., Brooklyn**—HOUSING—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by Unger & Unger, 130 Broadway, Zone 11, Tompkins Houses, Project NYS-46, 1180 apartment housing, Park, Throop, Myrtle and Tompkins Aves. $20,000,000. CD 2-24.

N. Y., Greenburg—SCHOOL—Town of Greenburg, Union School Dist. No. 6, Scarsdale, plans by Warren H. Ashley, 726 N. Main St., West Hartford, Conn., Greenburg Elementary School addn. $500,000, Edgemont Junior-Senior High School addn. $400,000, Arthur G. Beaulieu Assocs., 2348 Whitney Ave., Hamden, Conn., consult. engrs.

▲ **N. Y., New Brighton**—HOUSES—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by La Pierre Litchfield & Partners, 292 Madison Ave., New York, Zone 17, Richmond Terrace Houses, Proj. NY-5-39, Jersey St., Richmond Terrace and Crescent Ave. $6,000,000. CD 3-5.

▲ **N. Y., New York**—HOUSE OF DETENTION—Dpt. P. Wks., Municipal Bldg., Zone 7, plans by Alfred E. Poor, 400 Park Ave., Zone 22, Proj. C-80, Bronx House of Detention for Men addn., for Department Correction. $1,850,000.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, Baychester Houses, Project NYS-92, 500 apartment housing, Schieffelin Ave., E. 225th St. to E. 229th St., Bronx Boro. $8,000,000. CD 2-24.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Tippetts, Abbett, McCarthy, Stratton, 62 West 47th St., Zone 19, Audubon Houses, Project-NYS-94, 21 story apartment, W. 154th St., W. 155th St. and Amsterdam Ave. $3,750,000. CD 2-10.

▲ **N. Y., New York**—APARTMENT—New York City Housing Auth., 299 Broadway, Zone 7, plans by Mayer, Whittlesey & Glass, 31 Union Square, Zone 3, Gaylord White Houses, Project-NYS-95, 17 story apartment for 250 families, E. 104th St., and Second Ave. $2,500,000. CD 9-9-57.

▲ **N. Y., New York**—APARTMENT—New York City Housing Auth., 299 Broadway, Zone 7, plans by Edelbaum & Webster, 624 Madison Ave., Zone 22, E. Roberts Moore Houses-Proj. NY-5-48B, E. 149th St., Jackson and Trinity Aves., Bronx Boro. $7,990,000. CD 2-24.

▲ **N. Y., New York**—APARTMENT—New York City Housing Auth., 299 Broadway, Zone 7, plans by Greenberg & Ames, 303 4th Ave., Zone 10, Morrisania Houses, Proj. NY-5-48A, E. 169th St., Washington and Park Aves., Bronx Boro. $3,400,000. CD 2-24.

▲ **N. Y., Oneonta**—SCHOOL, etc.—City, plans by Warren H. Ashley, 726 N. Main St., West Hartford, Conn., school, library. $2,000,000. Arthur G. Beaulieu Assocs., 2348 Whitney Ave., Hamden, Conn., consult. engrs. Hubbard, Lawless & Blakely, 110 Whitney Ave., New Haven, Conn., mechanical engrs.

▲ **O., Bellevue**—SCHOOL—Bd. Educ., high school, $1,200,000. CD 11-11-52.

O., Bolivar—SCHOOL—Tuscarawas Valley Local School Dist., bond election May 5, high school. $600,000. CD 11-10, under O., Dover.

O., Harrison—SCHOOLS—Southwest Local School Dist., West Rd., bond election May 5, addns., alterations to five schools. $980,000. Edw. Rosendahl, Madison Rd., Cincinnati, archt.

▲ **Upper Arlington (P.O. Columbus)**—SCHOOLS—Upper Arlington Bd. Educ., 2100 N. Devon, bond election June 2, Junior High School, high school addn., elementary schools addns. $2,800,000. CD 2-27.

▲ **Ore., Portland**—SCHOOL—Parkrose School Dist. No. 3, 10614 NE Prescott St., plans by Annand, Boone & Lee, 1503 SW Taylor St., elementary school, Senior High School wing. $1,350,000.

Pa., Brookline—SCHOOL—Haverford Twp. School Bd., Brookline, plans by Baader, Young & Schultze, 1500

(Continued on page 226)

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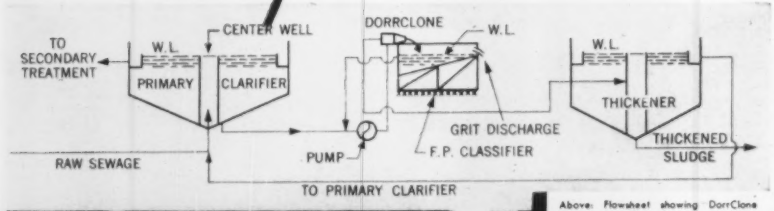

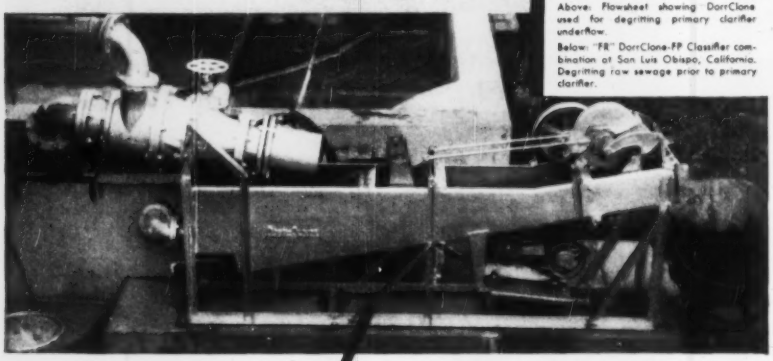

Above: Flowsheet showing DorrClone used for degritting primary clarifier underflow.

Below: "FR" DorrClone-FP Classifier combination at San Luis Obispo, California. Degritting raw sewage prior to primary clarifier.

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Full scale installations have proven that this unit is applicable to the degritting of raw sewage prior to primary sedimentation; the degritting of primary clarifier underflow prior to Densludge Thickening; and the washing of Detritor Collecting Tank discharge.

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Box 348, Maple, Ontario, Canada

(Continued from page 224)

Walnut St., Phila., high school addn. $400,000. CD 1/13/56, under Pa., Havertown.

† Pa., Center Square—SHOP—U. S. Eng., 2635 Abbottsford Rd., Phila., plans by Sanders & Thomas, Assocs., archts.-consult. engrs., Security Trust Bldg., G. M. Field Maintenance Shop. $150,000.

Pa., Media—JUVENILE DETENTION HOME—Comrs. Delaware County, Media, Juvenile Detention Home. $400,000.

Pa., Media—PRISON—Comrs. Delaware Co., Media, Broadmeadows County Prison wing, Lima. $700,000.

R. I., Pawtucket—SCHOOL—City, School Comm., City Hall, school, Broadway and Carnation Sts. $400,000. Constr. 1959-1960.

▲ R. I., Warwick—SCHOOL—City, School Bldg. Comm., School Admin. Bldg., 1849 Warwick Ave., plans by Robinson, Green & Beretta, 2 John St., Providence, Veteran's Memorial High School Addn. $1,810,000. Constr. 1959.

▲ Tenn., Jackson—SCHOOL—City, City Hall, Negro Junior High School, $600,000; elementary school, $500,000; Jackson Junior and Senior High Schools renovation and repair, $443,000.

Tenn., Jackson—SCHOOL—Madison County, Jackson, Junior High School. $400,000.

Tex., Andrews—HOSPITAL—Andrews County, Courthouse, Comrs. Court, county hospital, 13 acre site. $450,000.

Tex., Austin—SHOP, etc.—Austin Ind. School Dist., Austin, plans by Baldridge & Saunders, 208 E. 10 St., 65 x 221 ft., part bsmnt., air-conditioned maintenance shop, 64 x 224 ft. warehouse, 32 x 304 ft. garage and vehicle storage, 24 x 311 ft. materials storage, all steel frame, brick. $200,000. CD 11/10.

Tex., Beaumont—WAREHOUSES, etc.—Port of Beaumont, 1255 Main St., enlarging 3 warehouses, relocation railway tracks. $250,000. George Schaumburg, 2678 Laurel Ave., consult. engr. CD 4/27/55.

Tex., Harlingen—HOSPITAL—Calhoun County, Comrs. Court, Courthouse, county memorial hospital. Unit. $400,000.

Tex., Prairie View—SCIENCE—A & M College Sys. of Texas, College Station, plans by Edward Mattingly & Assocs., 5417 Crawford St., Houston, science bldg., for Prairie View College. $400,000. CD 12/13/57.

▲ Wash., East Wenatchee—SCHOOL—Eastmont School Dist. 206, East Wenatchee, Junior High School. $1,000,000.

Wash., Ephrata—SCHOOL—School Dist. 165, bond election Apr. 21, Junior High School, $492,000. W. and D. Rothe, 807 W. Yakima Ave., Yakima, archts. CD 2/6.

Man., Winnipeg—HOME—Province of Manitoba, Legislative Bldgs., plans by Smith, Carter, Searle & Assocs. 65 Dewdney Ave., concrete block, brick home for girls W. St. Paul. $500,000.

▲ Ont., Hamilton—HIGH SCHOOL—Hamilton Bd. Educ., 357 Hunter St. W., plans by Prack & Prack, 310 Main St., high school, Mohawk Rd., $2,000,000; plans by Wm. R. Souter & Assocs., 36 James St. S., high school, Nash Rd., $2,000,000.

Ont., Orangeville—HOME FOR AGED—Dufferin Co. Council, Courthouse, Home for Aged, Shelburne, $500,000.

Ont., Owen Sound—SCHOOL—Bd. Educ. plans by Jackson, Ypes & Assocs., 24 Nortown Shopping Plaza, 5385 Yonge St., Toronto, high school. $450,000.

Que., Joliette—COURT—Provincial P. Wks. Dpt., Parliament Bldgs., Quebec City, Magistrates's Court addn., St. Louis St., $600,000.

Que., Montreal—SCHOOL—Montreal Catholic School Comm., 3737 Sherbrooke St. E., plans by Gilbert Moreau, 3776 Queen Mary Rd., school exten., 420 de Malines St. $600,000. Paul Pelletier, 506 St. Catherine St. E., consult. engr.

COMMERCIAL BUILDINGS

▲ Ala., Birmingham—SHOPPING CENTER—Ivan & Ralph Black, 2130 4 Ave. N., plans by Carroll Harmon, 1720 28 Ave. S., 15 store shopping center, incl. parking area, in Center Point Section. $1,000,000. Bids in March.

▲ Calif., La Jolla—APARTMENTS—Vanderbilt Corp., 1107 Torrey Pines Rd., plans by John C. Lindsay, 1910 Main St., Santa Monica, sixteen 6 story rein.-con. apartments. $3,000,000-$4,000,000. Wheeler, Gray & Milton Abel, 600 Colorado Blvd., Los Angeles, consult. engrs.

▲ Calif., San Francisco—FINE ARTS—San Francisco Art Assoc., c/o J. S. Bolles, 800 Chestnut St., plans by Ernest Born, 730 Montgomery St., and E. T. Spencer, 251 Kearney St., fine arts bldg., Embarcadero near Ferry Bldg. $2,000,000.

▲ Calif., San Jose—SHOPPING CENTER—Morris Stulfast, Westwood Shopping Center, c/o John S. Bolles, archt., Pier 5, San Francisco, 500,000 sq. ft. shopping center. $10,000,000.

Colo., Denver—APARTMENT—Central Christian Housing Inc., 2403 S. Milwaukee, plans by Ramsey & Reeves, 882 S. Lipan, 6-10 story, 60-70 unit, apartment for elderly, 1375 High St. $550,000.

▲ Colo., Lakewood—HOSPITAL—Lincoln Hospital Corp., 1375 Overhill Rd., plans by John Milan, 9200 W. Colfax, 4 story, part bsmnt., 50,000 sq. ft. air-conditioned hospital addn., incl. 1 story, full bsmnt. auxiliary wing, power house, between 25 and 26 and Lee and Lewis Sts. $2,000,000.

Conn., Bridgeport—APARTMENT—Dominick Coppola, 31 Westwood Rd., Fairfield, plans by J. H. Schecter, 20 Cedarwood Lane, 40 unit apartment, Park Ave. $400,000.

Conn., Greens Farms—CLUBHOUSE—Greens Farms Golf & Ice Rink, c/o Norris Rossinoff, atty., Meadowcrest Dr., Fairfield, plans by J. Milton Cowperthwait, Jr., 2871 Main St., Stratford, clubhouse, incl. 18 hole miniature golf course and ice skating rink, Post Rd. $50C,000.

Conn., Middletown—STORE—Tower Marts, c/o Middletown Estates, Inc., Washington St. Ext., 40,500 sq. ft. 150x270 ft. department store, Washington St. Ext. $400,000.

Conn., New Britain—APARTMENT—Steven E. Perakos, 99 W. Main St., 3 story apartment, 64-80 Grove Hill. $750,000.

Conn., New Haven—OFFICE—First New Haven Corp., 42 Church St., plans by Carlin & Millard, 427 Temple St., 3 story office, 246 Church St. $400,000. Michael Menkus, Mills Way, Norfolk, consult. engrs. CD 1/29.

▲ Conn., New Haven—RESIDENTIAL COLLEGES—Yale University, 105 Wall St., plans by Douglas Orr, 111 Whitney Ave., and Eero Saarinen & Assocs., 1300 N. Woodward St., Birmingham, Mich., two 4 story, stone residential colleges, Tower Sq. $4,000,000. Henry A. Pfisterer, 111 Whitney Ave., consult. engr. Henri B. Van Zelm & Assocs., 1007 Farmington Ave., West Hartford, assoc. consult. engrs. CD 12/19/56.

Conn., New London—EDUCATION—Huntington St. Baptist Church, 28 Huntington St., plans by Andrew E. Egressey, 1149 Mamion Ave., Collinswood, N. J., 4 story, cement block education bldg., Washington St. $400,000.

Conn., Westport—MOTEL—Nat Greenberg County Agency, 117 E. State St., plans by Robert J. Waldron, 791 Main St., Willimantic, 76 unit motel, incl. swimming pool, Post Rd. $400,000.

Fla., Miami Beach—APARTMENT HOTEL—William Praver, 7630 Biscayne Blvd., plans by N. M. Giller & Assocs., 975 Arthur Godfrey Rd., 102 units, 10 story, 98x120 RC and CB-S Indian Creek Terrace Apartment Hotel, incl. swimming pool. $750,000. Jules P. Channing & Assocs., 71 NW 54 St., Miami, consult. engrs.

Ga., Dalton—HOSPITAL—Hamilton Memorial Hospital, plans by Abreau & Roberson, 141 Walton N. W., Atlanta, hospital addn. $900,000. CD 1/24.

▲ Ga., Lawrenceville—MERCHANDISE MART, etc.—Southeastern Merchandise Mart, Inc., 680 W. Peachtree St. N. W., Atlanta, 11 story merchandise mart and coliseum. $15,000,000.

▲ Ill., Chicago—HOSPITAL—Michael Reese Hospital, 2929 S. Ellis Ave., plans by Loebl, Schlossman & Bennett, 333 N. Michigan Ave., 4 story surgical wing

(Continued from page 228)

ARROW MOBILE HYDRAULIC HAMMER

AUTOMATIC • LOW COST

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The operator of the Arrow Mobile Hydraulic Hammer can set the hammer control upon **automatic** to deliver blows of uniform impact — or he can control the hammer manually. In addition, he can use the exclusive Arrow creeper-gear to move the machine at uniform speed up to 32 feet per minute. The machine can be driven over streets and highways under its own power up to 30 miles per hour.

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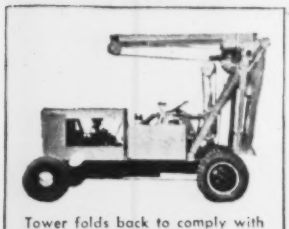

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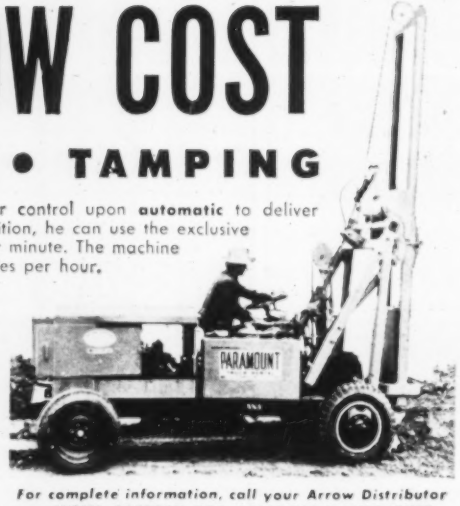
Service and maintenance easy — Arrow Mobile Hydraulic Hammers are engineered and built to give years of service under the constant pounding to which they are subjected. Parts for the chassis and motor are available at most MoPar Distributors.



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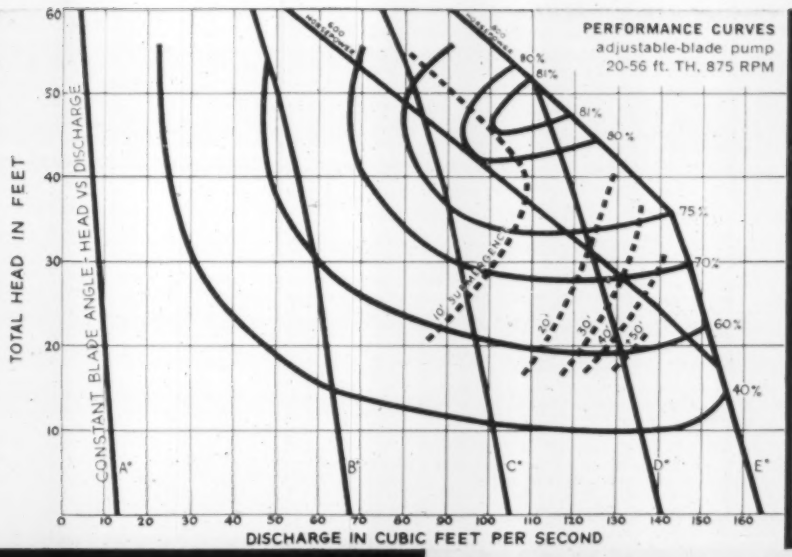
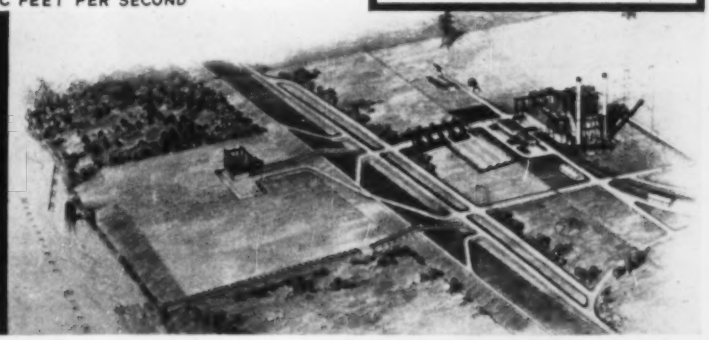


Performance curves of the A-C adjustable-blade axial flow pumps for Willow Glen illustrate their extreme flexibility. Pump operation is not restricted to a single head-discharge curve as is the case with fixed-blade pumps, but provides any discharge and head combination within the limits of motor horsepower and proper submergence.

Stone & Webster Engineering Corp. is designing and constructing the Willow Glen Plant at St. Gabriel, La. on the Mississippi River for Gulf States Utilities Co.



Flexibility and efficiency make Allis-Chalmers adjustable-blade pumps choice for Willow Glen

Two 30-inch Allis-Chalmers adjustable-blade axial flow pumps will be installed to provide condenser water for Unit #1 at the new Willow Glen Power Station. To meet requirements at minimum river level, with water temperatures that vary between 39°F and 90°F, the pumps are designed to deliver a total of 76,000 gpm against a 54-foot total head.

Extreme variation of suction pool elevation and the flexible condenser operation required for this station made adjustable-blade pumps the logical and economical choice. A-C adjustable-blade pumps attain relatively high efficiencies over a wide discharge and head range. This is accomplished by varying the pitch of the impeller blades while the pump is operating at constant speed. This adjustability keeps pumping costs at a minimum by combining low starting torque with high average efficiency.

Pump Bulletin 165 will give you complete information on high capacity axial flow pumps. To get your copy, write to Allis-Chalmers Manufacturing Co., Hydraulic Division, York, Penna.

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ALLIS-CHALMERS

(Continued from page 226)

addn., $2,000,000, bids in 1959; 3 story interne residence addn., $415,000, bids in Spring; 6 story research wing addn., $1,500,000. CD 3/6/58.

▲ **Ill., Chicago**—APARTMENT—Presbyterian-St. Lukes Hospital, 208 S. LaSalle St., plans by Skidmore Owings & Merrill, 100 W. Monroe St., employees apartment, 1753 W. Congress St. $3,400,000. CD 10/8/56.

▲ **Ill., Palatine**—SHOPPING CENTER—Robert R. Scher Co., 33 N. LaSalle St., Chicago, Zone 2, plans by Irving Karlin, 203 N. Wabash Ave., Chicago, Zone 1, Palatine Plaza Shopping Center, Hicks Rd. and Northwest Hy. $2,500,000. Bids in Spring.

▲ **Ind., Gary**—CHURCH CENTER, etc.—St. Sava Serbian Orthodox Church, 13 and Connecticut Sts., plans by Douglas F. Haley, 510 Jefferson St., church center, incl. gymnasium, bowling alley, swimming pool, 1 story school, 4 acres, east 49th Ave., 1¼ mi. east of Broadway Ave. $1,000,000.

La., Shreveport—DORMITORY—Centenary College, Centenary Blvd., plans by Pryton, Fisher, McKelvey, 502 Continental American Bank Bldg., girl's dormitory. $400,000. CD 11/20.

Mass., Randolph—SHOPPING CENTER—Owner's Agent, Saunders & Shannon, Inc., 1102 North Main St., plans by Salsberg & LeBlanc, 318 Harvard St., Brookline, shopping center. $600,000. CD 2/20.

Mass., Worcester—SUPERMARKET—Sunderland Realty Trust, c/o Doman & Salk, archts., 340 Main St., supermarket, Sunderland Rd. $400,000. Constr. 1959.

Mich., Ecorse — YMCA-YWCA BLDG. — Metropolitan YMCA-YWCA, 136 E. Elizabeth, Detroit, Mich., plans by Harley, Ellington & Day, Inc., 153 E. Elizabeth, Detroit, Mich., YMCA-YWCA bldg., south Fort and Eureka Sts. $850,000.

▲ **Minn., South St. Paul**—HOSPITAL—Sisters of the Divine Redeemer, Elizabeth, Pa., and 789 17th Ave. N., South St. Paul, 150-bed hospital. $2,225,000.

▲ **Mo., Kansas City**—APARTMENT—Brookside Investment Co., c/o Stan Praver, 8808 Longview Rd., Kansas City, Mo., plans by Voskamp & Slezak, 18 E. 11th, Kansas City, Mo., 12 story L-shaped reim.-con. apartment, incl. 134 car parking, Meyer Blvd. and Wornall. $2,500,000.

▲ **Mo., Kansas City**—APARTMENT—Downtown Redevelopment Corp., c/o James M. Kemper, 922 Walnut, Kansas City, Mo., plans by Keene & Simpson & Murphy, 15 W. 10th, Kansas City, Mo., 13 story, brick, glass, aluminum apartment, incl. 2½ level underground parking northwest corner 8th and Walnut. $2,500,000. Bids about July 1.

Mo., St. Louis—CHURCH—St. Louis Archdiocese Bldg. Comm., 4396 Lindell Blvd., Zone 8, plans by Murphy & Mackey, 6124 Enright Ave., Zone 12, Mo., remodeling, rehabilitation reconstr. church of St. Louis of France, 3rd and Walnut Sts. Over $400,000.

N. H., Greenfield—TREATMENT—Crotched Mountain Foundation, Greenfield, plans by Clinch, Crimp, Brown & Fisher, 177 State St., Boston, Mass., treatment bldg. $600,000. Bids Mar., 1959.

▲ **N. J., Hackettstown**—FINE ARTS DORMITORY, etc. —Centenary College for Women, Jefferson Ave., plans by Jan H. Pokorny, 306 E. 51 St., New York 22, N. Y., Fine Arts dormitory, swimming pool, gymnasium, $2,000,000.

▲ **N. J., Newark**—APARTMENT—Charles Gorovoy, 13 Sperber Rd., Fair Lawn, plans by Leonard Feinen, 320 Lincoln Ave., Hasbrouck Heights, 5 story apartment, Elizabeth Ave. $1,000,000.

N. J., Pennsgrove—SCHOOL—St. James Roman Catholic Church plans by Henry D. Dagit & Son, 1329 Race St., Phila., Pa., high school. $400,000.

▲ **N. J., Princeton**—APARTMENT DEVELOPMENT—Claire Levine, 93 Woodside Lane, 200 unit, garden type apartment development, Herrontown Rd., etc. $6,000,000.

▲ **N. J., Ramsey**—HOSPITAL—Owner, c/o Michael W. Frudakis, 185 Montague St., Brooklyn 2, N. Y., Ramsey Hospital, $2,000,000. Gennaro Mianulli, 185 Montague St., Brooklyn 2, N. Y., consult. engr.

▲ **N. Y., Bayville**—HOSPITAL—Oyster Bay Hospital, plans by Michael W. Frudakis, 185 Montague St., Brooklyn, Zone 2, 750,000 sq. ft. rein.-con. hospital conversion, alterations. $1,200,000. Gennaro Mianulli, 185 Montague St., Brooklyn, Zone 2, engr.

N. Y., Jamaica—APARTMENT, etc.—Julius Carter, c/o Michael W. Frudakis, archt., 185 Montague St., Brooklyn, Zone 2, 6 story apartment and community center. $800,000. Gennaro Mianulli, 185 Montague St., Brooklyn, Zone 2, engr.

N. Y., New York—APARTMENT—Cortland Operating Co., c/o Samuel Paul, archt., 89-51 164th St., Jamaica, 12 story apartment, west side of Bruckner Blvd., south of Bohre Ave. $800,000.

N. Y., New York—APARTMENT—Rowill Realty Co., c/o Koenig & Bachner, 300 Park Ave., Zone 17, plans by H. I. Feldman, 415 Lexington Ave., Zone 17, apartment, 319-23 E. 45 St. $670,000.

▲ **N. Y., New York**—OFFICE—Second-Forty Second St. Corp., 285 Madison Ave., Zone 17, will not construct 19 story office, northwest corner E. 42nd St. and Second Ave. $2,500,000. Project bandoned. CD 9/5/56.

N. Y., New York—APARTMENT—Jack B. Schleifer, 60 E. 42nd St., Zone 17, 9 story apartment, west side of 3d Ave. between 24 and 25th Sts. $900,000.

N. Y., Plainview—HOSPITAL—Dr. Anton Notey, c/o Doctors' Hospital, Freeport, plans by Gloster & Gloster, 253 Sunrise Hy., Rockville Center, hospital. $3,000,000.

▲ **N. Y., Riverhead**—SCHOOL—Diocesan Bldg. Office, Clinton St., Box 120, Rockville Center, plans by William J. Boegel, 12 E. 48th St., New York, Zone 17, N. Y. Mercy High School. $2,500,000. Gennaro Mianulli, 185 Montague St., Brooklyn, Zone 2, engr.

▲ **N. Y., Rockville Center**—MOTHER HOUSE—Diocesan Bldg. Office, Clinton St., Box 120, plans by Joseph Mathieu, 32 Court St., Brooklyn, Zone 2, Mother House for St. Joseph's Church. $1,500,000. Gennaro Mianulli, 185 Montague St., Brooklyn, Zone 2, engr.

▲ **N. Y., Uniondale**—SEMINARY—Diocese of Rockville Center, Clinton St., Box 120, Rockville Center, N. Y., plans by Eggers & Higgins, 787 United Nations Plaza, New York, N. Y., St. Pius X Preparatory Seminary, Front St. near Meadowbrook Parkway. $1,000,000.

▲ **O., Cleveland**—DORMITORY FACILITIES, etc.—Case Institute Technology, University Circle, Zone 6, dormitory facilities and fraternity houses. $2,500,000. Constr. 1963.
student union enlarging for food service facilities and college administration. $2,100,000. Constr. 1962.
physics bldg. extension. $920,000. Constr. 1959.

▲ **O., Cleveland**—AUDITORIUM, etc.—Fenn College, Euclid at 24th St., Zone 15, auditorium, gymnasium, classrooms. $2,500,000. Constr. 1965.

O., Lorain—PLANT—Asphalt Sales, Inc., 18030 Brookpark Rd., Cleveland, asphalt processing plant. $125,000.

▲ **O., University Heights**—STUDENT ACTIVITIES, etc. —John Carroll University, student activities, Units 2 & 3, $800,000. Constr. 1959. CD 12/15/52.
library, $1,500,000. Constr. 1960.
addnl. residence hall, $750,000. Hope to start in 1961.
administration wings for chemistry and physics work, $2,500,000. Hope to start in 1961.
school of business, economics and government, $1,500,000. Contr. 1962. CD 12/15/52.
addnl. residence hall, $750,000. To start in 1963.
classroom bldg, $2,250,000. Constr. 1966.

Okla., Cushing—HOSPITAL—Payne County Masonic Hospital, Cushing, plans by Coston, Frankfurt & Short, 323 Madison St., Oklahoma City, 1 story 62x200 ft., brick, steel hospital nursing wing. $400,000.

▲ **Pa., Bensalem**—RESIDENTIAL DEVELOPMENT—Tony Baker, 1604 Walnut St., residential development, Bensalem Twp. $15,000,000.

Pa., Lima—SHOPPING CENTER—Jackson F. Blackman, Swarthmore, shopping center, Baltimore Pike. $400,000.

Pa., Phila.—OFFICE, etc.—Phila., Pa. Baptist Assoc., 1703 Chestnut St., plans by Francis Johnson, Valley Forge, office, store and warehouse. $400,000. CD 1/16.

(Continued on page 232)

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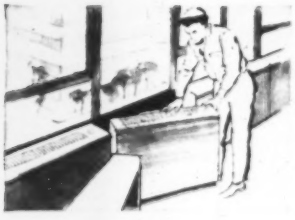

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(Continued from page 228)

R. I., Providence — HOSPITAL — Miriam Hospital, 164 Summit Ave., plans by Joseph Blumenkranz, 551 5th Ave., New York, N. Y., hospital addn. $800,000. Constr. 1959.

▲ Tenn., Chattanooga—SHOPPING CENTER—Independent Theaters, Inc., 509 Cherry St., 150,000 sq. ft. shopping center, Brainerd Rd., incl. parking area. $2,000,000.

Tex., Abilene—OFFICE—Abilene Savings Assn., 1155 N. 3rd St., multi-story office, N. 4th and Cedar Sts. Over $400,000.

Tex., Dallas—DWELLINGS—Billy Underwood Constr. Co., 3447 Whitehall St., 22 dwellings, off Marsh Lane. $438,100.

Tex., Dallas—DEPARTMENT STORE—W. L. Wyman & Son, 2408 N. Atoll St., plans by J. H. Williams & Co., 6501 Hillcrest St., Suburban Department Store in South Oak Cliff. $400,000.

Tex., El Paso—SHOPPING CENTER—DeWitt & Rearick, Real Estate, 500 N. Kansas St., shopping center. $400,000.

Tex., Houston—DWELLINGS—Calla Bldg. Co., 4523 Maple St., 17 dwellings, Bellfort Ave. $475,000; 13 dwellings, Willowbend Blvd., $440,000, Parkwest section of Westbury.

Tex., Houston—HOME FOR AGED—Central Church of Christ, 4100 Montrose Blvd., plans by Herman A. Kelling, 5247 Buffalo Speedway. Home for Aged. $500,000. Ira Jack Castles, 20 N. Sampson St., and Appling, Brown & Anderson, 1116 Hawthorne St., consult. engrs. CD 1/26.

Tex., Houston—CHURCH—Central Presbyterian Church, U. S. A., 5213 Montrose Blvd., plans by Wilson, Morris, Crain & Anderson, 3330 Graustark St., church. $800,000. Rob. J. Cummins, Bankers Mtg. Bldg., and Cook & Holle, 1951 Richmond Ave., consult. engrs. CD 2/20.

Tex., Houston—DWELLINGS—Dura-Built Constr. Co., F. H. Maxwell & C. B. McGee, 903 Studewood St., 20 dwellings, Section 9 of Meadowcreek. $410,000.

▲ Tex., Houston—NURSING COLLEGE—Texas Medical Center, 1133 M. D. Anderson Blvd., (Texas Women's University, Operators), plans by John Freeman, Jr., 1700 S. Main St., 6 story, 102,000 sq. ft. nursing college, 2 story classrooms. $1,500,000. Walter P. Moore, 2 Pinedale St. I. A. Naman, 2126 Welch St., consult. engrs. CD 11/11.

Tex., Houston—HOSPITAL—Tidelands Hospital Co., c/o Nyal L. Cline, archt., 1513 W. Alabama St., steel frame, masonry 52 bed hospital; 6 acre site off Port Arthur Freeway 73. $600,000.

▲ Tex., Pasadena—SHOPPING CENTER, etc.—Pasadena Plaza, E. Hoyle Graham & Assocs., c/o J. B. Gray, Jr., 911 E. Shaw St., 250,000 sq. ft. under one roof, shopping center, $2,500,000; auto parking center, $90,000, Shaver St. and Spencer Hy.

Tex., Plainview—STUDENT HOUSING—Wayland Baptist College, student housing facilities, incl. women's dormitory, (32) family apartments and 2 faculty family residences (Tex. 41-DH-103D). $736,000.

▲ Tex., San Antonio—HOSPITAL—Baptist Memorial Hospital, 111 Dallas St., plans by Bartlett Cocke, 3501 Broadway, 150-200-bed hospital expansion. $3,400,000. W. E. Simpson Co., Milam Bldg., consult. engr. CD 7/19/56.

Tex., San Antonio—SHOPPING CENTER—Don Danvers, 5307 Broadway Ave., shopping center, 5300 block, Broadway. $400,000.

Tex., San Antonio—DWELLINGS—Carl Gaskin, Builder, 6652 Callaghan Rd., 32 dwellings, Lackland Heights. $409,400.

Tex., San Antonio—FURNITURE STORE—Jonnie Furniture Co., 131 San Pedro Ave., plans by Reginald Roberts & Assocs., 2600 N. McCullough Ave., 3 levels, 116x177 ft., steel frame, furniture store; SW Military Hy. $400,000. R. Marvin Shipman, 202 Olmos Dr. West, and Oscar W. Schuhart, 3360 Fredericksburg Rd., consult. engrs.

▲ Tex., San Antonio—HOTEL—St. Anthony Hotel, Travis and Navarro Sts., plans by Atlee B. & Rob. M. Ayres, 342 W. Woodlawn Ave., 1100 room hotel remodeling. $1,000,000.

Tex., San Antonio—DWELLINGS—Schaefer Lumber Co., 202 Bickley St., 52 dwellings, Pleasanton Rd. $406,980.

Tex., San Antonio—DWELLINGS—A. J. Specia, Contractor, 529 W. Houston St., 60 low priced dwellings. $417,000.

Tex., San Antonio—HOSPITAL—Dr. Aureliano Urrutia, Sr., 1002 Hildebrand Ave., plans by Oscar Urrutia, c/o owner, 50 bed hospital, W. Houston and N. Laredo Sts. $500,000.

Wash., Port Orchard—SHOPPING CENTER—G. H. Gans, Jr., Dexter Horton Bldg., Seattle; Zone 4, 50,000 sq. ft. shopping center. $500,000.

▲ Wash., Seattle—RESIDENCE-APARTMENTS—Seattle First Methodist Home, Inc., 1306 2 Ave., Seattle, Zone 4. Plans by J. Graham & Co., 1426 5 Ave., Seattle, Zone 1, 9 story residence-apartments to be known as Bayview Manor. $3,500,000.

Wis., Eau Claire—HOSPITAL—Luther Hospital, 310 Chestnut St., hospital addn. $700,000.

▲ Wis., Kenosha—COLLEGE—Carthage College, Carthage, Ill., plans by L. Monberg & Assocs., 815 57 St., college bldgs. $5,000,000. Mittlebusher & Tourtelot, 36 S. State St., Chicago, Ill., consult. engrs. CD 4/30/57.

Wyo., Cheyenne—HOTEL-MOTEL—Mel Conron, Pioneer Hotel, plans by Harold Potter, 1500 Ridgeway Dr., Lincoln, Neb., 2 story, 20,000 sq. ft. hotel-motel. $600,000.

Alta., Calgary—OFFICE—Royal Trust Co., 315-8th Ave. SW, 6 story office, 7th Ave. and 5th St. W. Over $500,000.

▲ Alta., Edmonton—HOTEL, etc.—Eden Roc Investments Ltd., Financial Bldg., plans by Green, Blankenstein, Russell & Assocs., 222 Osborne St. E., Winnipeg, Man., 9 or 10 story hotel, 8 story office, connected by interior concourse. $6,000,000. W. Sefton & Assocs., Ltd., 901 Yonge St., Toronto, Ont., consult. engrs.

▲ Alta., Edmonton—HOTEL—Sheraton Hotels Ltd., Mount Royal Hotel, Montreal, Que., plans by Diamond Clark & Assocs., Edmonton, 12 story hotel. $6,000,000. CD 2/24.

Ont., London—APARTMENT—Redomada Realty & Development Ltd., Hamilton, 6 story, 24 unit cooperative apartment, 89 Ridout St. S. $500,000.

Que., Montreal—APARTMENT—Amico Realties, Ltd., 6982 St. Humbert St., plans by Irving Caruso & Bernard Rosen, 324 Victoria Ave., 7 story, 2 bsmnts., 70 x 70 ft., rein.-con., brick 48 suite apartment. $400,000.

Que., Riviere du Loup—PROVINCIAL HOUSE—Rev. Soeurs de l'Enfant Jesus de Chauffailles, plans by Albert Leclerc, Edifice Caisse Populaire, Rimouski, 4 story provincial house. $700,000.

Que., Shawinigan—COMMERCIAL—Joseph Drolet, Ltee., 493 Rieme Rue, commercial bldg., corner Mercier and 5th Sts. $400,000.

▲ Que., Three Rivers—SEMINARY—LeSeminaire de St. Joseph des Trois Rivieres, Laviolette St., 3 story, 70x140 ft., concrete, structural steel, stone seminary addn. $1,000,000.

INDUSTRIAL BUILDINGS

Ariz., Tucson—LABORATORY—Joseph Timan, Snyder Rd. and Bear Canyon, 12,000 sq. ft. surface communications laboratory, near here. $125,000. Radio Corp. of America, 30 Rockefeller Plaza, New York, N. Y. lessee.

Calif., Canoga Park—FACTORY—North American Aviation, 633 Canoga Ave., plans by Kenneth H. Neptune, 441 Beverly Dr., Beverly Hills, 2 story, 301x421 ft., concrete factory, 6500 Canoga Ave. $840,000. Bids soon.

Calif., Redwood City—LABORATORY, etc.—S. H. Frank & Co. Bayshore Hy., P.O. Box 471, marine laboratory and plant addn. $700,000. Constr. 1959.

Conn., Westbrook—PLANT—Lee Co., Pettipaug Rd., plans by Seb. J. Passanese, 164 Court St., Middletown, 2 story, 40 'x 170 ft. mfg. plant, Pettipaug Rd. $136,000.

▲ Florida—POWER PLANT—East Central Nuclear Group, Inc., and Florida West Coast Nuclear Group, c/o General Nuclear Engineering Corp., sub. Combustion Engineering Co., engrs., Dunedin, Fla., 50,000 kw. gas-cooled reactor nuclear power plant. $26,000,000.

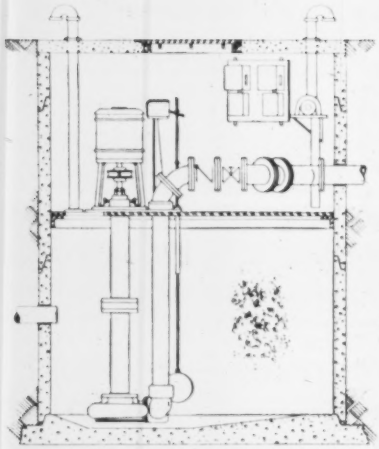
(Continued on page 234)

AUTOMATIC

UNDERGROUND LIFT STATION

with the weil HEAVY DUTY

Vertical Screenless Sewage Pumps



When sewage or drainage water cannot drain by gravity to the main trunk sewer or treatment plant an automatic lift station is required. Illustrated at the left is the most economical installation to build employing the submerged style vertical ejector in the wet pit.

The motor is totally enclosed and equipped with a water-tite conduit box. Float switch, starters, alternator (for duplex units), and disconnect switches are all NEMA-4 water-tite.

The piping is simple and economical. Gate valves may be omitted if necessary. A check valve should be used in a horizontal discharge pipe.

Pit may be constructed of concrete tile. Pit may be as small as 84" diameter. A cover separates the wet pit and the motor room at top and an atmospheric vent pipe runs from wet pit to a point above ground. A ventilating blower may be installed for the upper section of the pit.

For complete specifications ask for Bulletin C-900. Weil Engineers are always available to provide technical information for your special applications.

This NON-CLOG Impeller built into the WEIL Sewage Pump supplies the ideal method of pumping sewage and unscreened liquids containing solids.

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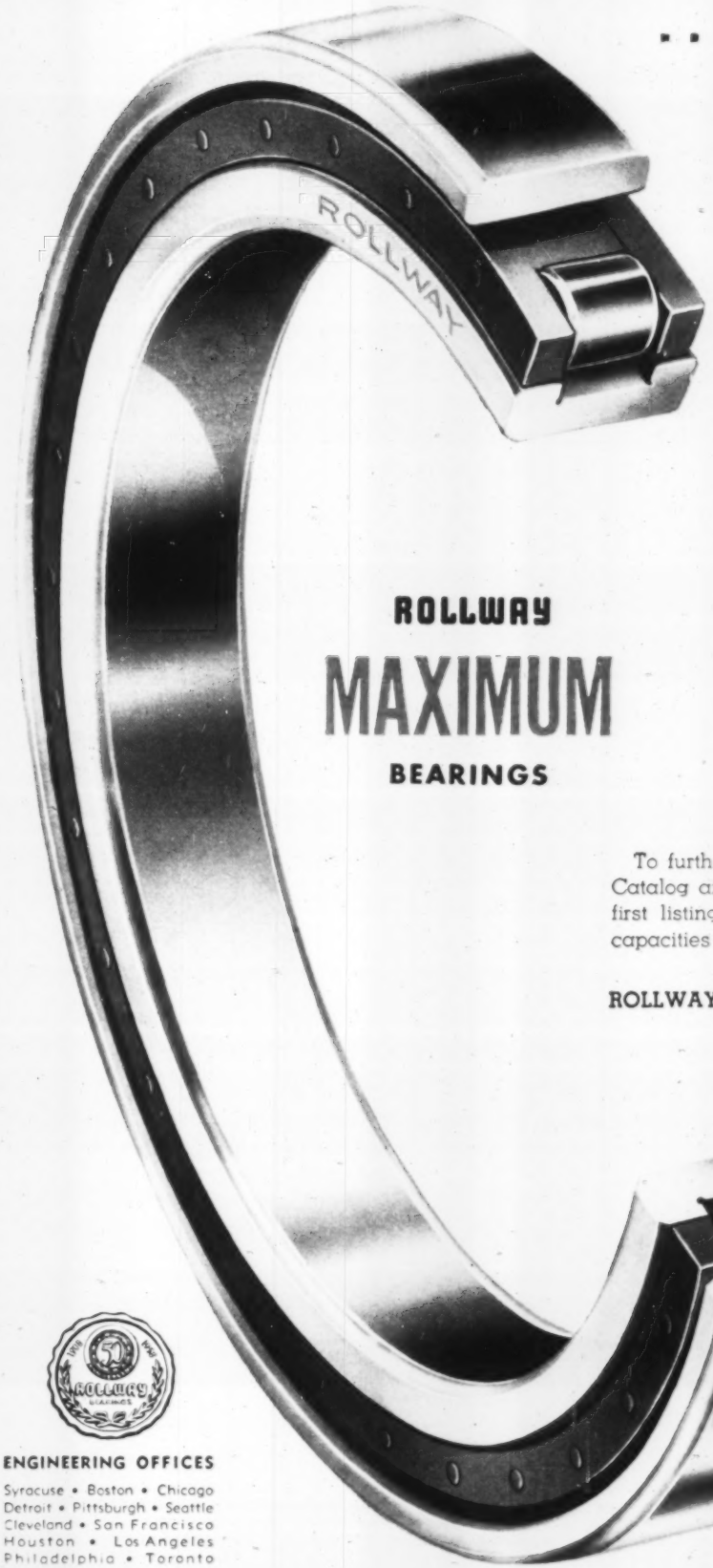

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ROLLWAY
Maximum
ROLLER BEARINGS

(Continued from page 232)

Ill., Granville—PLANT—Moews Seed Co., Grayville, hybrid seed corn grading plant. $150,000.

▲ Ill., Kankakee—PLANT—A. O. Smith Corp., 3533 N. 27th St., Milwaukee, Wis., farm feed storage unit mfg. plant addn. $2,100,00.

Ill., Waukegan—LABORATORY, etc.—Midland Industrial Finishes Co., Water St., plans by Swanson & Ladehoff, 523 S. Genesee St., laboratory and office addn. $120,000.

Iowa, Davenport—PLANT—Mayer Packing Co., 1337 W. 2 St., 4 story packing-plant addn. $500,000.

Iowa, Sioux City—PLANT—Glaser Packing Co., Chicago and Lafayette Sts., plans by Troy & Stalder, 3127 S. 52 St., Omaha, Neb., 1 story, 48 x 115 ft. concrete block packing plant. $120,000.

Iowa, Sioux City—PLANT—Meyer Packing Co., Lafayette and Chicago Sts., plans by Troy & Stalder, 3127 S. 52 St., Omaha, Neb., 1 story, bsmnt., 48x120 ft. meat packing plant. $150,000.

▲ Kan., Pittsburg—PLANT—Spencer Chemical Co., Dwight Bldg., Kansas City 5, Mo., plant to process uranium dioxide for nuclear fuels. Over $1,000,000.

Minn., Roseville (P.O. St. Paul)—TERMINAL, etc.—Hart Motor Express, Inc., 2600 University Ave. S. E., Minneapolis, 1 story, 70 x 220 ft. terminal, 2 story, 60 x 100 ft. office, 1 story, 100 x 160 ft. garage, west of Cleveland Ave., 3 blocks north of TH 36. $500,000.

N. J., Moorestown—MANUFACTURING, etc.—Phila. Insulated Wire Co., 220 N. 3 St., Phila., Pa., plans by The Ballinger Co., 1625 Race St., Phila., Pa., mfg. and office. $350,000. Bids soon.

O., Springfield—PLANT—Cascade Mfg. Co., 2201 N.E. 201 (G), Portland, Ore., plant for production hydraulic cylinders and equipt. $200,000. Six Industries, Inc., 627 Railroad, consult. engr.

▲ Okla., Marlow—GASOLINE PLANT—British-American Oil Co., 800 Bay St., Toronto 1, Ont., natural gasoline plant, Deep Kmow Oil Field. $1,000,000. Refinery Engineering Co., 108 N. Trenton St., Tulsa, consult. engr.

Pa., King of Prussia—WAREHOUSE, etc.—Kurtz Bros., 1304 Arch St., Phila., warehouse and office bldg., Rte. 202. $500,000.

▲ Pa., Phila.—GROCERY WAREHOUSE—Penn Fruit Co., Grant Ave. and Blue Grass Rd., grocery warehouse. $2,000,000.

▲ Pa., Phila.—GROCERY WAREHOUSE, etc.—Pevloff Bros., Inc., Whitaker and Cayuga Sts., plans by David Middleman, 32 W. Bryn Mawr Ave., Bryn Mawr, grocery warehouse and office, Phila. Food Distribution Center. $2,500,000.

S. C., Estill—PLANT—Southern Soya Corp., Estill, plant to process soybean oil. $500,000.

Tenn., Memphis—WAREHOUSE—United States Steel Corp., Supply Div., 208 S. LaSalle St., Chicago, Ill., 1 story, steel warehouse. $110,000.

Tex., Addison—PLANT—American Screen Mfg. Co., Inc., 2436 S. Harwood St., Dallas, 20,000 sq. ft. plant, Cotton Belt Ry. Industrial Tr. $175,000.

▲ Tex., Bay City—PLANT—Christie, Mitchell & Mitchell & Associated Companies, Houston Club Bldg., Houston, 50,000,000 cu. ft. daily capacity gas processing plant, Palacios Field. $2,500,000.

Tex., Decatur—PLANT—Christie Mitchell & Mitchell Co., Houston Club Bldg., Houston, gas processing plant enlargement. $650,000.

Tex., Denison—FREIGHT TERMINAL—Central Freight Lines, Inc., 4101 Fulton St., Houston, freight terminal between Sherman and Denison, Grayson Co. $145,000.

▲ Tex., Forth Worth—ENGINE RUN STATIONS, etc.—Convair, Div. General Dynamics, Grants Lane, plans by J. Turnbull, 4310-C, Westside Dr., Dallas, archt.-consult. engr., rein.-con. structural steel, 12-B58 Engine Run Stations and 5 Soundsuppressor Stations. $2,750,000. CD 7/27/56.

Tex., Victoria—BAKERY—Richter's Bakery, 2201 Broadway Ave., San Antonio, bakery, 3.6 acre site. $750,000.

▲ Utah, Garfield—SMELTER—Kennecott Copper Corp., Utah Copper Div., Kearns Bldg., Salt Lake City, renovation and modification of smelter, replacement of 48 roasters with sys. of feeding "green concentrates" to five reverberating furnaces at Garfield. $10,000,000.

Utah, Salt Lake City—PLANT—Eitel-McCullough, Inc., R. Wade Langley, mgr., 1678 Pioneer Rd., 20,000 sq. ft. plant addn., Industrial Center, 1750 S. Redwood Rd. $500,000.

Wis., Milwaukee—FACTORY—Master Lock Co., 2600 N. 32 St., plans by Henry R. Slaby, 2750 N. Teutonia Ave., 4 story, 50x89 ft., brick and blocks, rein.-con. floor factory addn., concrete fdn. $400,000.

▲ B. C., Castlegar—PULP AND SAWMILL—Celgar Ltd., 1030 W. Georgia, Vancouver, plans by H. A. Simons, Ltd., archts.-engrs., 16 E. Hastings, Vancouver, 500 ton pulp and sawmill. $50,000,000. CD 7/30/51.

N. B., Sussex—PLANT—Atlantic Dairy Products, Sussex, powdered milk production plant. $900,000.

Que., St. Charles de Mandeville—PLANT—Birchwood Mfg. Co., St. Charles de Mandeville, 1 story, 130 x 300 ft., concrete, wood plant addn., warehouse and sawmill. $300,000.

UNCLASSIFIED

▲ Alaska—TRANSMISSION LINE—Homer Efectric Assn., transmission line from Cooper Lake to Kassilof. $1,000,000. North Pacific Consultants, Park Bldg., Portland, Ore., consult. engrs. CD 7/14.

▲ California—OFFSHORE PIPE LINE, etc.—Standard Oil Co. of California, 225 Bush St., San Francisco, 2-6 in. and 1-8 in. 17,000 ft. offshore pipe line, production platform, tanks, meters, etc. $680,000; 20 in. loading line, pumping facilities and 217,000 bbl. storage tank. $900,000, Carpenteria, Summerland and Santa Barbara.

Kan., Dodge City—SWIMMING POOL, etc.—City, City Hall, swimming pool, bathhouse, etc., in City Park. $280,000. Wilson & Co., 631 E. Crawford St. and P.O. Box 28, Salina, Kan., consult. engrs. CD 2/19.

▲ Louisiana—UNDER WATER PIPE LINE—Freeport Sulphur Co., 161 E. 42nd St., New York, N. Y., 7 mi. under water pipe line to pump sulphur from Grand Isle Mine to Louisiana Shore. $2,000,000. CD 9/3/57, under Industrial Buildings, La., Port Sulphur.

La., New Orleans—STREET LIGHTING—City, City Hall, voted bonds Feb. 21, installation street lighting. $100,000.

▲ Maryland—PARK SITE—National Park Service, Dept. Interior, Interior Bldg., 19 and C Sts. N.W., Wash. 25, D. C., developing 1,150 acre park site on both sides of Washington-Baltimore Parkway, 5 mi. northeast of District of Columbia, Greenbelt. $3,100,000. (no appropriation).

N. J., Asbury Park—BOARDWALK—City, City Hall, raising and building 60 ft. wide boardwalk south of 8 Ave. $500,000. Constr. 1960.

N. J., Atlantic City—SWIMMING POOL, etc.—Chalfonte-Haddon Hall Hotel, Carolina Ave. and Boardwalk, plans by Rodney C. Williams, 9 S. Granville Ave., Margate, swimming pool and sun deck. $150,000. Bids soon. CD 5/20, under Commercial Buildings.

Okla., Waukomis—TRANSMISSION LINE, etc.—City, City Hall, natural gas transmission line and distr. sys. $100,000. H. T. Lawrence, 1802 NW 21 St., Oklahoma City, consult. engr.

▲ Pennsylvania—GAS TRANSMISSION LINE—New York State Natural Gas Co., No. 2 Gateway Center, Pittsburgh, gas transmission line, Elk and Clearfield Counties. FPC authorized. $1,538,000.

Texas—RURAL POLE TELEPHONE LINES—Midstates Telephone Co., Georgetown, rural pole telephone lines, Georgetown area, Bell, Milam, Llano and Williamson Counties. $110,000. CD 12/12/57.

Tex., Corpus Christi—AIR-CONDITIONING—City, City Hall, air-conditioning Memorial Coliseum. $300,000. Smyth & Smyth, Gulf Security Bldg., consult. engrs. CD 2/6.

Tex., Houston—RAILROAD TRACKS—Southern Pacific Railway Lines, L. A. Loggins, ch. engr., 913 Franklin Ave., 16 classification and lead railroad tracks, Englewood Yards, Radar controlled. $575,000. Constr. 1959. CD 2/27/53.

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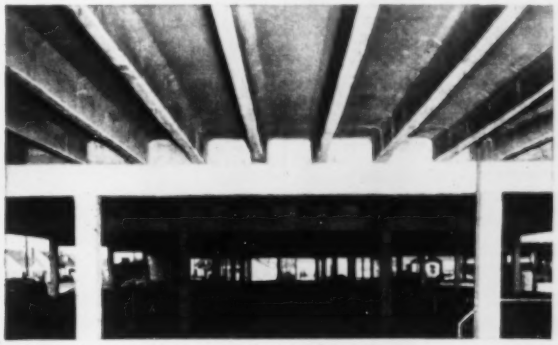
Another noteworthy example of the trend in one-story school construction toward reinforced concrete framing is the Deerfield Terrace Elementary School in Linden, New Jersey. Architects and Engineers Finne-Lyman-Finne, of Elizabeth, New Jersey, reported that the cost of the new school constructed with reinforced concrete frame was competitive with ordinary wall-bearing type of construction.

Photographs below show the reinforced concrete joist roof during construction by J. M. Straus & Co., Newark, New Jersey. Note the exposed roof of the playroom-gymnasium. Sprayed-on acoustic material was applied directly to the rough concrete to give a finished ceiling. The roof is cantilevered over the classroom windows to provide shade.

Before you build a school, hospital, or commercial building, investigate this economical, flexible, firesafe, and timesaving medium of construction.

Placing the forms for reinforced concrete joist roof.



Underside of concrete joist roof after stripping forms.

View of the underneath side of the concrete joist roof after spraying with acoustic material. This presents an attractive, economical finish for the ceiling.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 23 Connecticut March 24 Massachusetts

BUILDINGS—BA

Conn., Enfield—SCHOOL—BA 3/26—Town, Elem. Bldg. Comm., N. Main St., Thompsonville, White Acres Elementary School, Brainard Rd. $400,000. Plans deposit $100. Walter R. Furey, 308 Enfield St., Thompsonville, archt. A. John Macchi, 57 Farmington Ave., Hartford, engr. CD 10/29.

Me., Kittery—HOSPITAL—BA 3/26—Tri-County Osteopathic Hospital, Inc., 133 Rogers Rd., Proj. Maine 27, hospital, Rte. 1 and Maine Turnpike. $400,000. Maurice E. Witmer, 3 Hillside Dr., Portsmouth, N. H. CD 2/4, under LB.

Me., South Portland—SCHOOL—BA 3/26—City, Supt. Schools, 40 Chase St., Senior High School. Wilbur R. Ingalls, Jr., 45 Exchange St., Portland, archt. Maine Engineering Service Co., 133 Court St., Auburn, mech. engrs. CD 12/31.

Conn., Warehouse Point—SCHOOL—BA 3/31—Town of East Windsor, School Bldg. Comm., East Windsor High School, East Windsor, Broad Brook Elementary School addns., alterations and Warehouse Point Elementary School, second addn., $400,000. Plans deposit $50. Malmfeldt Assocs., 36 Pearl St., Hartford, archts. Marchant & Minges, 1007 Farmington Ave., West Hartford, engrs. CD 1/12.

Vt., Middlebury—STUDENT UNION—BA 4/2—Middlebury College, Prest. & Fellows, Middlebury College, student union bldg. former site of Hillcrest Hall. Approx. $400,000. Plans deposit $50. Freeman, French & Freeman, 158 Bank St., Burlington, archts. CD 8/1.

BUILDINGS—SLC

Conn., Norwich—COMMERCIAL—Normain Corp., c/o Chandler & Palmer, archts., 16 Franklin St., soon lets contract commercial bldg., 425 West Main St. $400,000.

HEAVY CONSTRUCTION—LB & CA

VERMONT—State Hy. Dpt., State Office Bldg., Montpelier. Bids opened 3/6.

Ralph B. Goodrich, Inc., 211 Hinesburg Rd., South Burlington, Vt., LB $840,867, est. $800,000, sub-base with c. conc. surf. course, incl. two 9 span composite WF beam bridges, town of Middlesex, Int. Rte. 89, Middlesex, Contr. 1, Proj. I-89-2 (4). CD 1/23.

▲ VERMONT—State Hy. Dpt., State Office Bldg., Montpelier.

Rowe Constr. Co., 1500 Salem St., Malden, Mass. CA $1,816,103, sub-base with bit. c. conc. surf. course, incl. two 3 span composite WF beam bridges, I 89-2 (3), Contr. 4, Berlin, Montpelier and Middlesex. Bids Feb. 27. CD 3/4, under LB.

▲† Oneglia & Gervasini, Inc., Casson Ave., Torrington, Conn., LB $1,081,998 (9 bidders), road relocation, Naugatuck River Dam Areas A, B and D, Thomaston Dam. CIVENG-19-016-59-3, CONNECTICUT, U. S. Eng., 310 State St., Springfield, Mass. Bids Mar. 4. CD 2/17.

BUILDINGS—LB & CA

Morris & Son Constr. Co., 219 Central St., Lowell, Mass., LB Est. $400,000, MOTEL and STEAK HOUSE, NASHUA, N. H. Daniel Webster Development Corp., Daniel Webster Hy., Nashua, N. H. Bids Mar. 4. CD 3/3.

Kay-Locke, Inc., 32 Allerton St., Roxbury, Mass., CA Est. $400,000, SHOPPING CENTER, Boston Rd., BILLERICA, MASS. Cosmo DeBonis, c/o Herman L. Feer & William E. Nast, archts., 27 School St., Boston, Mass. Stop & Shop, Inc., 395 "D" St., South Boston, Mass. and F. W. Woolworth Co., 639 Mass. Ave., Cambridge, Mass., lessees. Bids Feb. 19. CD 2/11.

D'annolfo Bros., Inc., 19 Franklin St., Stoneham, Mass., CA $400,000, est. $408,000, RESIDENTIAL DEVELOPMENT, "Brentwood", 24 houses, Skilton Lane, BURLINGTON, MASS. Martin Cerel, 18 E. Central St., Natick, Mass.

Owner, c/o J. G. Akillian, Inc., 715 Trapelo Rd., Waltham, Mass., Separate Contracts, $400,000 RESIDENTIAL DEVELOPMENT "Liberty Acres", 23 houses, Prescott Rd., CONCORD, MASS.

Paul Sardella, 55 Stella Rd., Roslindale, Mass., LB $444,608, HOUSING for the ELDERLY, FRANKLIN, MASS. Town Housing Auth., Town Hall, Franklin, Mass. Bids Mar. 5. CD 2/13.

Bank Bldg. & Equipment Corp. of America, 1130 Hampton Ave., St. Louis 10, Mo., CA Est. $660,000, design and construct 4 story, bsmt. OFFICE, SPRINGFIELD, MASS. Union Federal Savings & Loan Assn., 1341 Main St., Springfield, Mass.

Owner, c/o Murphy & Murphy, Drive-In-Real Estate, Inc., Rte. 20, Sudbury, Mass., Separate Contracts, $420,000, RESIDENTIAL DEVELOPMENT, 28 houses, Sudbury-Waltham, Line, SUDBURY, MASS.

E. J. Cross Co., 150 Prospect St., Worcester, Mass., CA $518,762, est. $500,000, INSURANCE BLDG., WORCESTER, MASS. The Paul Revere Life Insurance Co., 18 Chestnut St., Worcester, Mass. Bids Feb. 25. CD 3/6, under LB.

J. Adolf Johnson, Inc., 66 Bryant Rd., Cranston, R. I., CA Est. $400,000, RECREATION BLDG., PROVIDENCE, R. I. Berry Hill Corp., 1 Washington Ave., Providence, R. I. Bids Jan. 30. CD 1/27.

Morton Miller, Avery St., South Windsor, Conn., Owner Builds, $725,000, 50 HOUSES, "Avery Heights" Kelly Rd., Section 3, SOUTH WINDSOR, CONN.

▲ John Woods, Brainard Rd., Thompsonville, Conn., CA $1,642,000, 138 HOUSES, "Meadow Gardens" Elm St., THOMPSONVILLE, CONN. Meadow Gardens, Elm St., "Thompsonville, Conn., Awarded Mar. 6. CD 2/2.

Mauro Constr. Co., P.O. Box 329, New Haven, Conn., LB $414,000 (7 bidders), 1 story, John G. Gilmartin Elementary School, Jersey St., WATERBURY, CONN. Town, Bd. Educ., 271 E. Main St., Waterbury, Conn. Bids Mar. 4. CD 2/20.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ Md., Baltimore—PRODUCE MARKET—BA 3/23—City Market Auth., City Hall, Zone 2, (selected list bidders), produce market, 6400 Pulaski Hy. $1,500,000. Cyril H. Hebrank, 2111 N. Charles St., Zone 18, archt.

† Md., Edgewood—ENLISTED MEN'S SERVICE CLUB—BA 4/1—U. S. Eng., 24th St. and Maryland Ave., Baltimore, Zone 18, 1 story, masonry enlisted men's service club, Army Chemical Center, ENG-18-020-59-16. $100,000-$500,000. Fenton & Lichtig, 2219 Maryland Ave., Baltimore, Zone 18, archts. CD 8/31/56.

▲ N. J., Newark—PARKING GARAGE—BA 4/6—Newark Parking Auth., 605 Broad St., underground parking garage at Military Park. $5,000,000. Extended date. Frank Grad & Sons, 11 Commerce St., engrs.-archts. CD 2/3.

▲ Pa., Hummelstown—SCHOOL—BA 4/7—Pa. Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Junior-Senior High School for Lower Dauphin Jt. School Dist. $2,912,000. Plans deposit $75 general, $50 others. E. G. Good, Jr., 904 N. 2nd St., Harrisburg, archt. CD 8/13.

N. Y., Albany—THEATRE—Bids Asked—Neil Hellman, c/o Leon M. Einhorn, archt., 93 State St., Albany, theatre, Washington Ave. $500,000. CD 11/18.

N. J., Burlington—SCHOOL—Bids Asked—Roman Catholic Diocese of Trenton, 1101 Lawrence Rd., Trenton, parochial school, for St. Paul's Roman Catholic Church, 233 Union St. $400,000. Henry Moran, State Rd. and Jefferson Ave., Princeton, engr.-archt. CD 2/28/56.

▲ N. Y., Amherst—MEDICAL and OFFICE, etc.—Bids Asked. Transit Lanes, Inc., 5 Susan Dr., Clarence, N. Y., (selected list bidders), medical and office and bowling alley, Transit and Sheridan Rds. $2,000,000. Albert Rumischik, 263 Linwood Ave., Buffalo, archt. CD 11/11.

BUILDINGS—SLC

▲ Del., Wilmington—APARTMENT—Aaron Colish, archt., 117 S. 17 St., Phila., Pa., soon lets contract apartment, 1800 N. Broom St. for Park Tower, Inc., c/o archt. $5,000,000. David Bloom, 1411 Walnut St., Phila., Pa., engr. CD 3/4.

Pa., Flourtown—CONVALESCENT HOME, etc.—Harry H. Phillips, archt., 225 S. Sartain St., Phila., soon lets contract convalescent home, paving, Stenton Ave. for Rest Haven, Inc., Malin Rd., Broomall, $400,000. CD 1/14, under LB.

Pa., Phila.—OFFICE—Western Savings Fund Society, Broad and Chestnut Sts., soon lets contract office bldg. alterations, addns. $900,000. George M. Ewing Co., Western Savings Fund Society Bldg., Phila., Pa., archt.

HEAVY CONSTRUCTION—LB & CA

▲ Collyer Insulated Wire Co., 292 Roosevelt Ave., Pawtucket, R. I., LB $2,430 Sch. 1; LB $184,836 Sch. 3; LB $777,845 Sch. 4; LB $353,400 Sch. 7, wire and cable Niagara Power Project NP-15, NEW YORK. Power Authority of State New York, The Colliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Mar. 10. CD 8/15/57.

Kaiser Aluminum & Chemical Sales Co., 360 N. Michigan—Chicago, Ill., LB $34,795 Sch. 2; LB $180,865 Sch. 6; LB $94,556 Sch. 8, wire and cable Niagara Power Proj. 15 (New York).

Rome Cable Co., Rome, N. Y., LB $212,740 Sch. 5; LB $189,080 Sch. 9, wire and cable, Niagara Power Proj. 15 (New York).

▲ NEW JERSEY—Comr., State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 3/10.

Gaskill Constr. Co., Hartford Rd., Riverside, N. J., LB $1,583,756 (15 bidders), repave 0.917 mi. Rte. 18 (1953), Sect. 2, from Clifton Ave. to New Jersey Turnpike, incl. Interchange at Rte. U. S. 1, City of New Brunswick and East Brunswick Twp., Fed. Proj. No. U-112(8), Middlesex Co. CD 2/20.

Senia Bldg. Constr., 687 E. 28 St., Paterson, N. J., LB $167,516 (6 bidders), general contract Stage 2, sewage treatment plant addns., Contr. 46, HACKENSACK, N. J., Bergen Co. Sewer Auth., Room 400, Admin. Bldg., Hackensack, N. J., Bids Mar. 5. CD 2/13.

Turbine Equipment Co., 1064 U. S. Hy. No. 22, Mountainside, N. J., LB $694,497 (9 bidders), Contr. 46A, equipment and piping, (Hackensack, N. J.).

Lafayette Iron Works, Inc., 649 Grand St., Jersey City, N. J., LB $167,000 (1 bidder), Contr. 46B, structural steel and misc. metal work, (Hackensack, N. J.).

Edward Ellis & Son, Inc., Marlton Pike and Harvard Ave., Merchantville, N. J., LB $593,995, sewer and force main, Contr. 2, PENNSVILLE, N. J. Lower Penns Neck Twp. Sewerage Auth., Municipal Bldg., 90 North Broadway, Pennsville, N. J. Bids Feb. 9. CD 1/12.

Henry Shenk Co., 1115 Sassafras St., Erie, Pa. LB $409,575, general constr. sewage plant, ERIE, PA. Erie Sewer Auth., City Council Chambers, City Hall, Erie, Pa. Bids Mar. 4. CD 1/20.

William H. Gill, Primos, Pa. LB $553,990, general constr. refuse incinerator and parking area, Chester Twp., MEDIA, PA. Comrs. Delaware Co., Courthouse Annex, Media, Pa. Bids Feb. 24. CD 1/12.

▲† Isaac Degenaars, 231 Greenwood Ave., Midland Park, N. J., CA $1,394,905, buildings and shops, utilities, Dover Air Force Base, No. 36-109-59-27, DOVER, DEL., U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Bids Feb. 25. CD 3/3, under LB.

BUILDINGS—LB & CA

Sano-Rubin Constr. Co., Inc., 616 Delaware Ave., Albany, N. Y., CA $571,300, general contract 7 story NURSES DORMITORY, ALBANY, N. Y. Albany Hospital, New Scotland Ave., Albany 8, N. Y. Bids Jan. 20. CD 2/3, under LB.

Iorio Constr. Co., 22 West First St., Mt. Vernon, N. Y., CA Est. $400,000, St. Joseph's RECTORY, BRONXVILLE, N. Y. Archdiocesan Bldg. Comm., 451 Madison Ave., New York 22, N. Y. Bids Mar. 5. CD 2/12.

Benrich Realty Corp., 1855 Rockaway Parkway, Brooklyn 12, N. Y., Owner Builds, $486,000, 27 HOUSES, 1020-22 Avenue "J and 1015-34 E. 102nd St., Owner Builds, $432,000, 24 HOUSES, 1003-29 East 104th St. and 1004-50 E. 105th St., BROOKLYN, N. Y. Morris Rothstein & Son, 186 Joralemon St., Brooklyn 2, N. Y., archts.

Elm Park Estates, 26 Court St., Brooklyn 2, N. Y., Owner Builds, $400,000, 20 HOUSES, 2445-83 Coyle St., BROOKLYN, N. Y. Larry Meltzer, 188 Montague St., Brooklyn 2, N. Y., archt.

A. A. La Fountain, 159 Beech St., Hackensack, N. J., LB $598,000, JUNIOR-SENIOR HIGH SCHOOL, Kendall Park Section, South Brunswick Twp., DAYTON, N. J. Bd. Educ., Twp. of South Brunswick, George Rd., Dayton, N. J. Bids Feb. 17. CD 1/16.

Joseph St. Miklossy, 93-34 St., Warren Point, N. J., Own Forces, $450,000, 15 HOUSES, Parmelee Ave., FAIR LAWN, N. J.

Herbert Kendall and David Savage d/b/a Kendall Builders, Inc., P. O. Box 456, Franklin Park, N. J., Own Forces, $500,000, SCHOOL, Kendall Park development, Rte. 27, South Brunswick, FRANKLIN PARK, N. J., David Savage, Drakes Corner Rd., Princeton, N. J., archt.

Campus Park Homes, Inc., 500 High St., Mount Holly, N. J., Separate Contracts, $793,000, 61-unit RESIDENTIAL DEVELOPMENT, GLASSBORO, N. J.

J. A. LaRocca Bros., 63 Zabriskie St., Jersey City, N. J., CA $712,000, 10 story, 76 unit HOUSING, Broadway between 69th and 70th Sts., Proj. No. NJ 36-2, GUTTENBERG, N. J. Housing Auth. Town of Guttenberg, 6810 Park Ave., Guttenberg, N. J. Bids Feb. 25. CD 3/6, under LB.

Sellars & Stearns Constr. Co., 84 Glen Ridge Ave., Montclair, N. J., CA Over $600,000, est. $680,000, PAROCHIAL SCHOOL addn., Green Village Rd., MADISON, N. J. Diocese of Paterson and Parish of St. Vincent's, Green Village Rd., Madison, N. J. Bids Nov. 6. CD 11/3.

Edmund H. Cheval Co., 592 Paramus Rd., Paramus, N. J., LB $644,350, Fairview and Midland Ave. SCHOOL addns., PARAMUS, N. J. Bd. Educ., Paramus, N. J. Bids Mar. 6. CD 2/27.

Rocco Duce, 76 James St., Toms River, N. J., Separate Contracts, $450,000, 50 unit RESIDENTIAL DEVELOPMENT, Charlotte Dr., etc., TOMS RIVER, N. J., Paul B. West, 911 N. Main St., Toms River, N. J., archt.

Bierhoff & Finder, Allen Ave., Vineland, N. J., LB $400,000, RESIDENTIAL DEVELOPMENT, Carlisle Dr., etc., VINELAND, N. J. Carlisle Heights B & B Development Co., 518 Landis Ave., Vineland, N. J., John A. Fletcher, 111 Landis Ave., Vineland, N. J., archt.

Howard Fox, 1478 Morris Ave., Union, N. J., Owner Builds, $800,000, 32 HOUSES adjoining Fairmount Park, Hooper Ave., WEST ORANGE, N. J.

▲ Becker & Lipshutz, 4411 N. Broad St., Phila., Pa. Separate Contracts, $1,200,000, RESIDENTIAL DEVELOPMENT (73), Cedar Rd., AMBLER, PA.

United Constr. Co., 1204 Lincoln Ave., Pittsburgh 6, Pa., CA $533,700, general constr. ELEMENTARY SCHOOL and secondary facilities addn. for Berlin Brothers Valley Jt. School Bd., BERLIN, Pa. Pa. Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. Bids Feb. 3. CD 2/9, under LB.

N. Pizio & Sons, 2500 Chestnut Ave., Ardmore, Pa., Separate Contracts, $400,000, RESIDENTIAL DEVELOPMENT, Hilltop Rd., etc., BERWYN, PA.

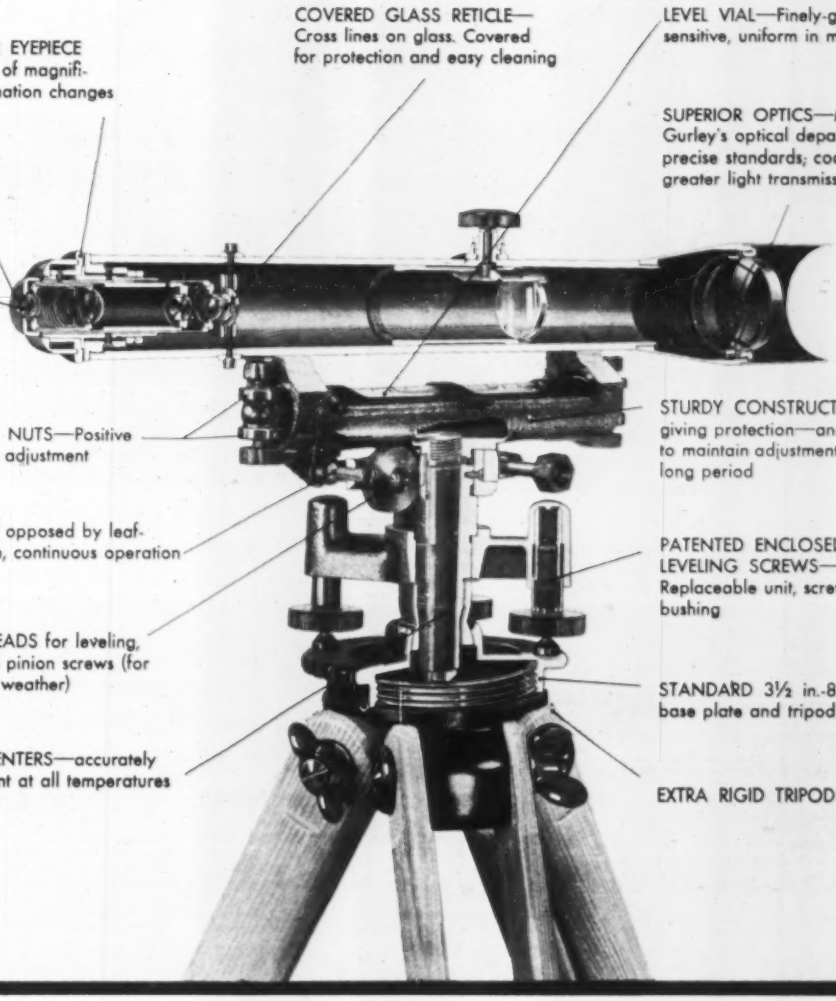
▲ Becker & Lipschutz, 4417 N. Broad St., Phila., Pa. Separate Contracts, $1,200,000, RESIDENTIAL DEVELOPMENT, (80) Brittany Farms, CHALFONT, PA.

▲ Ritter Bros., 1511 N. Cameron St., Harrisburg, Pa. CA Est. $1,000,000, DEPARTMENT STORE, SERVICE STATION, HARRISBURG, PA. Sears Roebuck & Co., 4640 Roosevelt Blvd., Phila., Pa. Bids Feb. 4. CD 1/23.

(Continued on page 238)

The Gurley Engineers Level

Wye or Dumpy Types



VARIABLE POWER EYEPIECE
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EXTRA RIGID TRIPOD

Model 372 Dumpy Level

GURLEY

W. & L. E. GURLEY, UNION PLAZA, TROY, N. Y.

(Continued from page 236)

Christopher Gigliotti & Son, 9140 Verree Rd., Phila., Pa., Separate Contracts, **$750,000**, RESIDENTIAL DEVELOPMENT (58) Valley Ave., etc., PHILA., PA.

Crossway Constr. Co., Lee J. Cortan, P. O. Box 387, Scarsdale, N. Y., Separate Contracts, **$500,000**, 90 unit MOTEL, RESTAURANT and pool, University Ave., PHILA., PA. Henry Moger, Jr., 250 Main St., White Plains, N. Y., archt.

William H. Gill, Jr., Primos, Pa., LB **$854,360**, general constr. NURSES HOME, 8th St., PHILA., PA. Pennsylvania Hospital, 8th and Spruce Sts., Phila., Pa. Bids Mar. 3. CD 2/19.

▲ **McNichol Paving & Constr. Co.**, 52nd St. and Grays Ave., Phila., Pa., CA **$1,655,713**, general constr. Mantua Hall HOUSING (153 units) 35th St. and Fairmount Ave., PHILA., PA. Phila., Pa. Housing Auth., 42 S. 15th St., Phila., Pa. CD 3/3, under LB.

Scott Constr. Co., 5604 Florence Ave., Phila., Pa. Separate Contracts, **$400,000**, RESIDENTIAL DEVELOPMENT, 23rd St., PHILA., PA. Joseph L. Bunett, 7017 Woodbine Ave., Phila., Pa., archt.

Food Fair Stores, Inc., 401 E. Erie Ave., Phila., Pa., Separate Contracts, **$400,000**, SUPERMARKET, Hanover St., WILKES-BARRE, PA. Louis Kasoff, c/o owner, chf. archt.

Cummins Hart Constr. Co., Inc., 3400 E. Chase St., Baltimore, Md., CA Est. **$775,000**, two double ingot heating FURNACES, three heating FURNACES to produce stainless steel, BALTIMORE, MD. Armco Steel Corp., 703 Curtis St., Middletown, O. CD 9/20/56.

Paul Pet Constr. Co., 2100 Ashburton St., Baltimore 19, Md., Separate Contracts, **$400,000**, HOUSING DEVELOPMENT, Ashburton St. and Koko Lane, BALTIMORE, MD.

Piracci Constr. Co., 2552 Woodbrook Ave., Baltimore 17, Md., LB **$774,000**, Base Bid (12 bidders), brick, concrete, steel, block LABORATORY SCHOOL, State Teachers College, TOWSON, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore **1**, Md. Bids Feb. 19. CD 1/23.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 24 West Virginia

STREETS AND ROADS

March 24 West Virginia — April 13 Kentucky

▲† **Kentucky and Tennessee**—BA 3/26—U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn., generators for Barkley Hydroelectric Power Plant, right bank of Cumberland River, 1.3 mi. north of Eureka and 5 mi. southwest of Kuttawa, Barkley Proj., Livingston Co., CIVENG-40-058-59-9. Extended date. CD 1/30.

† **Miss., Meridian**—AIR STATION IMPRVS.—BA 4/2—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., roads and utilities, Naval Auxiliary Air Station, NBy 21842. $500,000-$1,000,000. Extended date. CD 2/27.

▲ **Fla., Tampa**—BA 4/7—City, City Hall, bridge on Buffalo Ave. over Hillsboro River. $1,500,000. Gibbs & Hill, 608 Tampa St., engrs.

BUILDINGS—BA

Fla., Coral Gables—BANK—BA 3/31—City National Bank, c/o E. T. Reeder & Assocs., archts, DuPont Plaza Center, Miami, 2 story, 102x165 ft. bank, Lejeune Rd. and Almeria Ave.

La., New Orleans—SCHOOL—BA 3/31—Jules K. de la Vergne, archt., Pere Marquette Bldg., 3 story, 40,000 sq. ft. brick, concrete block high school for Holy Name of Jesus Mercy Catholic Church, 6363 St. Charles. Plans deposit $35.

S. C., Charleston—HOMES—BA 3/31—Charleston Housing Auth., 20 Franklin St., 102 unit Ben Tillman Homes Addn. $800,000. CD 1/15.

▲ **Ga., Atlanta**—HEALTH CENTER—BA 4/8—Fulton Co. Comrs. Road & Revenues, Courthouse, Fulton Co. Health Center. $1,300,000. Plans deposit $100. McDonald & Co. Assocs., 41 Exchange Pl. S.E., archts. CD 3/5.

HEAVY CONSTRUCTION—LB & CA

C. H. Jimison & Sons, Inc., P. O. Box 2181, Huntington, W. Va., LB **$583,300**, terminal bldg. and control tower for airport, Wayne Co., HUNTINGTON, W. VA. Tri-State Airport Auth., P. O. Box 434, Huntington, W. Va. Bids Feb. 20. CD 2/12.

▲ **F. L. Showalter, Inc.**, 2900 Fulks St., Lynchburg, Va., CA **$1,368,225**, water filtration plant addn., HIGH POINT, N. C. City of High Point, City Hall, High Point, N. C. CD 2/4, under LB.

C. W. Gallant Co., P. O. Box 11053, Charlotte, N. C., CA **$536,231**, sanitary sewer lines, GREENVILLE, S. C. Parker Water & Sewer Dist., 8 S. Church St., Greenville, S. C. Bids Feb. 10. CD 2/17, under LB.

S. J. Curry & Co., P. O. Box 1436, Albany, Ga., CA **$526,670**, sewage treatment plant imprvs., COLLEGE PARK, GA. City, City Hall, College Park, Ga. Bids Jan. 27. CD 2/4, under LB.

▲ **Powell Bros., Inc.**, P. O. Box 281, Fort Lauderdale, Fla., CA **$1,097,832**, sanitary sewer imprvs. (sewage outfall line and Ocean Pier). Contract C. LAKE WORTH, FLA. City, City Hall, Lake Worth, Fla. CD 1/30, under LB.

Joe Reinertson, Inc., 2027 NE 7 Ave., Miami, Fla., CA **$500,572**, sanitary sewer imprvs. (sewer lines) (Lake Worth, Fla.).

LOUISIANA—State Hy. Dpt., Capitol Annex, Baton Rouge, W. H. Patterson Co., Inc., Box 2229, Baton Rouge, La., CA $591,782, widn.; surf. existing concrete pavement 12 mi. Raceland-Valentine Hy., Rte. 1. SP 64-06-20 & 64-05-27. FASP S-252-(8), Lafourche Parish. Bids Feb. 18. CD 2/26, under LB.

▲ **Boh Bros. Constr. Co.**, 2400 Cypress St., New Orleans, La., LB **$833,830** (3 bidders), completion sewerage collection sys., NORCO, LA. Sewerage Dist. No. 1, Shell Oil Bldg., Norco, La. Bids Mar. 4. CD 2/5;

Binnings Constr. Co., Inc., 400 Dakin St., Metairie, La., LB **$368,535** (13 bidders), completion of sewage treatment plant, etc. (Norco, La.).

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort.

Foster & Creighton Co., 724 1st American Natl. Bank Bldg., Nashville, Tenn., CA **$2,746,982**, grade, drain, 5.059 mi. Interstate, Covington-Lexington Rd., Price Pike Rd., Proj. I 75-7(8) 177 SUS 738(1), Boone Co. Bids Feb. 20. CD 2/25, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort. Bids opened 3/6.

Ky.—**Ruby Constr. Co. & Ruby Mining Co.**, 101 Sugg St., Madisonville, Ky., LB **$1,465,170** (8 bidders), b. conc. Class I, 0.359 mi. North-South Expressway, I 65-6(5)134, SP 56-798, Jefferson Co. CD 2/10;

Ky.—**Ralph E. Mills Co.**, 410 Ann St., Frankfort, Ky., LB **$2,161,937** (11 bidders), grade, drain, surf., 5.218 mi. Louisville-Lexington Rd., I 64-3(8)40 Shelby Co.;

Ky.—**T. C. Young Constr. Co.**, Williamsburg, Ky., LB **$143,626** (3 bidders), traffic bound surf., 2.948 mi. Glens Fork-Cundiff, RSI-870, Altair Co.;

Ky.—**Ashland Asphalt Paving Co.**, P. O. Box 1108, Ashland, Ky., LB **$147,238** (3 bidders), b. conc. surf., 24.4 mi. various road RS-GR 4(59), Boyd Co.;

Ky.—**Saltsman Constr. Co.**, Box 482, Bardstown, Ky., LB **$99,367** (3 bidders), grade, drain, 0.454 mi. Olive Hill-Carter City, S 112(3), Carter Co.;

Ky.—**A. W. Walker & Son**, 15 Bank St., Mt. Sterling, Ky., LB **$438,265** (2 bidders), grade, drain 7.906 mi. Landsaw-Bethany-Breathitt County Line, S 694(1), Wolfe Co. CD 2/18.

L. F. Wilder Constr. Co., P. O. Box 9786, Birmingham, Ala., LB **$625,029**, water sys., Divisions 1 and 2 (water lines) KNOXVILLE, TENN. Knox-Chapman Utility Dist., Courthouse, Knoxville, Tenn., Bids Feb. 11, CD 2/4;

Brownlee & Kesterson Constr. Co., 2437 Henson Rd., Rd., Knoxville, Tenn., LB **$132,290**, water sys., Division 3 (water treatment plant) (Knoxville, Tenn.).

BUILDINGS—LB & CA

▲ **Pentagon Recreation Center, Inc.**, 600 Spring Lake Terrace, Fairfax, Va. Owner Builds. **$2,500,000**. SPORT CENTER, incl. outdoor artificial ice skating rink, 15th and South Eades St., ARLINGTON, VA. Sheridan & Behm, 2030 16th St. North, Arlington, Va., archts.

Ernest Foard, 626 Pecan Ave., Charlotte, N. C. CA Est. **$400,000** CHURCH SANCTUARY, CHARLOTTE, N. C. Sardis Road Presbyterian Church, c/o contractor.

▲ **Church Creek Development Co.**, 55 Broad St., Charleston, S. C., Separate Contracts, **$2,000,000**, 175 RESIDENCES, Church Creek Subdivision, CHARLESTON, S. C.

Smith & Jones, Inc., 936 West Peachtree St., N. W., Atlanta, Ga., LB **$410,000** low rent HOUSING, GA 74-3 and GA 74-4, ELBERTON, GA. Elberton Housing Auth., Elberton, Ga. Bids Mar. 5. CD 2/19.

▲ **Hellrung Constr. Co.**, Box 518, East Point, Ga., LB **$1,176,585** Griffin-Spalding Co. HOSPITAL addns., GRIFFIN, GA. Griffin-Spalding Co. Hospital, Griffin, Ga. Bids Mar. 4. CD 1/29.

Edward M. Fleming Constr. Co., 4121 NW 25 St., Miami, Fla., CA **$586,999**, HOSPITAL addn., 5000 University Dr., CORAL GABLES, FLA. Doctors Hospital 5000 University Dr., Coral Gables, Fla. Bids Jan. 29. CD 2/18, under LB.

▲ **M. Slote**, P. O. Box 1267, Jacksonville Beach, Fla., Separate Contracts, **$1,250,000**, 125 RESIDENCES, JACKSONVILLE BEACH, FLA.

Clutter Constr. Corp., 377 Westward Dr., Miami Springs, Fla., LB **$789,000**, Brownsville JUNIOR HIGH SCHOOL, NW 50 St., NW 23 Ave., MIAMI, FLA. Dade Co. Bd. P. Instruction, Admin. Bldg., 275 SW 2 St., Miami, Fla. Bids Mar. 4. CD 2/11.

David M. Woolin & Sons, Inc., 18320 S. Dixie Hy., Perrine, Fla., CA **$850,000**, 100 RESIDENCES, SW 188 St. and SW 125 Ave. (S. Miami Heights) MIAMI, FLA. Prospect Development Corp., Box 287, Perrine, Fla. Gerard Pitt, 4375 Ingraham Hy., Miami, Fla., archt.

Hanover Corp., 1555 Daytona Rd., Miami Beach, Fla., CA **$800,000**, 102 unit Indian Creek Terrace APARTMENT HOTEL, incl. swimming pool, 5065 Collins Ave., MIAMI BEACH, FLA. William Praver, 7360 Biscayne Blvd., Miami, Fla. CD 3/4.

▲ **Brown & Cushman**, 411 7 St., West Palm Beach, Fla., Separate Contracts, **$3,000,000**, 240 RESIDENCES, Flamingo Rd., WEST PALM BEACH, FLA.

Motes Constr. Co., 501 N. Broadway, Sylacauga, Fla., CA **$400,000**, MOTEL-RESTAURANT, ALEXANDER CITY, ALA. Horseshoe Bend Motel, c/o contractor.

▲ **Jones & Hardy**, Box 98, Montevallo, Ala., LB **$1,718,604** BIOLOGICAL and PLANT SCIENCES BLDG., AUBURN, ALA. Alabama Polytechnic Institute, Auburn, Ala. Bids Mar. 5. CD 1/26.

▲† **Kesk, Inc.**, 136 South Derbigny St., New Orleans, La., CA **$3,142,500**, 200 unit Capehart HOUSING, Bossier Base, ENG-03-050-59-27, BOSSIER CITY, LA. U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids Jan. 8. CD 1/12, under LB.

Pittman Constr. Co., Box 8116, New Orleans, La., LB **$759,964** (13 bidders), 2 story, 34,050 sq. ft. rein.-con., brick, concrete block and aluminum window wall HOSPITAL, JENNINGS, LA. Jennings American Legion Hospital, Jennings, La. Bids Mar. 3. CD 2/5.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 25 Michigan — March 26 Indiana

STREETS AND ROADS

March 25 Michigan — March 26 Indiana

March 31 Ohio

BUILDINGS—BA

Ind., Columbus—HOSPITAL—BA 3/25—Comrs. Bartholomew Co., County Courthouse, Bartholomew County Hospital addns. $750,000. Plans deposit $25. J. M. Rotz Engineering Co., 1919 N. Meridian St., Indianapolis, engr. Hill & Wupper, Inc., 915 State Life Bldg., Indianapolis, engr.-archt. CD 1/29.

O., West Unity—SCHOOL—BA 3/26—B. Educ., Millcreek-West Unity School Dist., grade school addn. $426,000. CD 11/14.

Wis., Mukwonago—SCHOOL—BA 3/26—Bd. Educ., Elementary School Dist., Clarendon Ave. School addn. $468,000. Plans deposit $35. R. N. Le Vee & Assocs., 1000 W. College Ave., Appleton, archts. CD 10/2.

O., Massillon—SCHOOL—BA 4/3—Tuslaw Bd. Educ., RD. No. 2, elementary schools addns. Plans deposit $50. Firestone & Motter, 1412 Cleveland Ave. N. W., Canton, Zone 3, archts. CD 11/12.

Ill., Chicago—GARAGE, etc.—Bids Asked—Grand-Kilbourn Building Corp., c/o Rosen & Horowitz, archts., 53 W. Jackson Blvd., Zone 4, 1 story, 50,000 sq. ft. brick, steel, concrete block garage and office. $500,000.

HEAVY CONSTRUCTION—LB & CA

Raymond Concrete Pile Co., Republic Bldg., Cleveland 15, O., CA Est. $533,000, design and construct rehabilitation ore dock on Cuyahoga River at Cleveland Works, CLEVELAND, O. Jones & Laughlin Steel Corp., 401 Liberty Ave., Pittsburgh, Pa. CD 11/19, under Industrial Bldgs.

† **Geo. W. Timmons Co.**, 7211 New Germany Rd., Dayton 3, O., LB **$579,726**, est. $593,650 (3 bidders), SAC storage facilities, ammunition storage magazines, Wright-Patterson Air Force Base, ENG-15-029-59-44, DAYTON, O. U. S. Eng., P.O. Box 59, Louisville 1, Ky. Bids Mar. 5. CD 2/18.

▲ **Jechura Bros.**, 5700 Telegraph Rd., Toledo, O., CA Est. over $1,000,000, six-furlong tracks at Raceway Park, Dixie Hy. and Alexis Rds., TOLEDO, O. Toledo Raceways, Inc., 210 E. Alexis Rd., Toledo, O. CD 1/15.

ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

Green Constr. Co., Oaktown, Ind., CA **$586,599**, earth grading 1.31 mi. and 155 mi. FAI Rte. 8 from 0.5 mi. north of Lawrenceville, southeasterly Lawrence Co. CD 2/20, under LB.

▲ **J. M. Corbett Co.**, 2500 S. Corbett St., Chicago, Ill., CA **$636,748**, Armitage Ave. overpass bridge to carry Northwest Expressway over Armitage Ave., CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago, Ill. Awarded Mar. 6. CD 2/27, under LB;

M. J. Boyle & Co., 2529 N. Elston Ave., Chicago, Ill., CA **$512,310**, North Ave. overpass bridge to carry Northwest Expressway over North Ave. (Chicago, Ill.).

▲† **C & C Constr. Co., Inc.**, 4625 Industrial Rd., Fort Wayne, Ind., LB **$1,171,876**, 2 story office and laboratory, water treatment plant, 500,000 gal. ground water reservoir, 1 m.g. elevated steel tank, Richard I. Bong Air Force Base, ENG-11-032-59-32, KANSASVILLE, WIS. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids Feb. 25. CD 1/21.

▲ **MICHIGAN**—State Hy. Dpt., Mason Bldg., Lansing, Bids opened 3/4.

Mich.—Denton Constr. Co., 20415 Macke Ave., Grosse Pointe Woods 36, Mich., LB **$1,348,321**, 4.1 mi. roadway from existing US 10 near Sarle Rd. north of Freeland, north to M 20. (Midland-Bay City expressway) between Carter and Flajole Rds. incl. interchange at connection with M 20, Saginaw and Bay Counties, CD 2-16; LB **$269,777**, 1.2 mi. roadway widn. and surf. M 78 from Elms Rd. northeasterly to Dye Rd., Genesee Co.; LB **$2,095,280**, relocated M 78 Project to incl. 6.3 mi. divided roadways from M 13 northeast to Elms Rd., Genesee Co. CD 2/11;

Mich.—Holloway Constr. Co., Livonia, Mich., LB **$2,034,123**, 5.4 mi. Detroit-Chicago Expressway (U.S. 12 relocated), incl. 5 mi. expressway and 5 structures from 18½ Mile Rd. in Calhoun County east to 22½ Mile Rd., structures on 5 mi. section will incl. grade separation to carry 18½ Mile Rd. over Expressway; Partello Rd. full interchange; Rice Creek dual bridge; 20 Mile Rd. grade separation; 22½ Mile Rd. full interchange;

Mich.—L. A. Davidson, 213 E. St. Joseph, Lansing, Mich., LB **$1,279,215**, 1.4 mi. Detroit-Chicago Expressway and 3 structures from west bank of Kalamazoo River to US 12 near Wheatfield Rd., dual bridge over Kalamazoo River, grade separation Waffles Rd. grade separation to carry New York Central RR tracks over expressway.

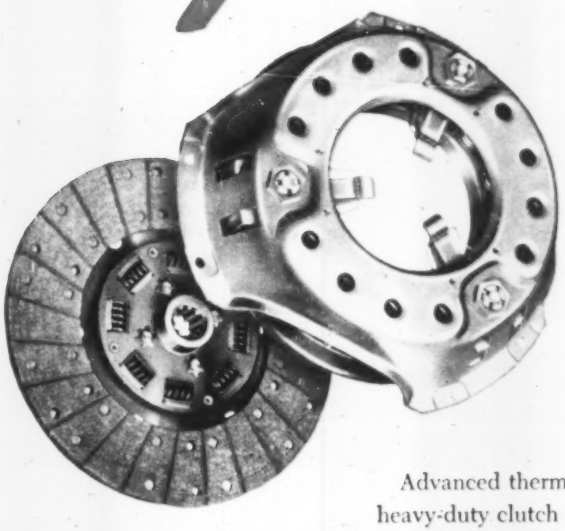
BUILDINGS—LB & CA

▲ **Avon Shore Homes**, 5531 State Rd., Parma 34, O., Owner Builds, **$2,000,000**, 100 HOMES, Avon Lake west of Avon Center Rd. from Walker to Lake Rds., AVON LAKE, O.

Schirmer-Peterson Co., 6830 Beaver Ave., Cleveland 4, O., CA **$433,200**, est. $360,000 (9 bidders), VILLAGE HALL and RECREATION HALL, BROOK PARK, O.

(Continued on page 240)

Lipe DIRECT PRESSURE CLUTCH



Vital component in today's most economical system of power transmission, the Lipe DPB Heavy-Duty Clutch costs less by itself . . . materially reduces the sales price of the truck . . . and affords substantial savings in over-all truck-operating costs per mile.

Other elements of the power-train contribute to these savings, but the Lipe DPB Heavy-Duty Clutch absorbs the greatest shocks and fiercest friction, dissipates the most heat, and by its simplicity, direct drive, easy adjustment and replacement-exchange, keeps the vehicle rolling with less cost for fuel, brake relining, oil replenishment and repair. Its worth in highway safety and preventative brake maintenance alone places it far in advance of costlier and more complicated drive components.

Advanced thermodynamic design and positive air circulation add up to a heavy-duty clutch of uncomplicated design with few moving parts. In short, it's a clutch with a low maintenance cost that matches both its low first cost and greatly lower truck-mile costs of operation.

● Now available in 12", 13", 14", 15" single plate and two-plate models. Write for complete information.

LIPE ROLLWAY

Lipe-ROLLWAY CORPORATION
SYRACUSE 1, N. Y.

(Continued from page 238)

Village, 5950 Eastland Rd., Cleveland, O. Bids Feb. 24. CD 2/13.

Storybook Homes, Inc., 4066 Colony Rd., Cleveland 21, O., Owner Builds, $700,000, 25 addnl. HOMES, Lynn Dr., off Mayfield Rd., CHESTERLAND, O.

▲ Northland Builders, Inc., 1433 Wolfangle Rd., Cincinnati, O., Owner Builds, $1,215,000, 45 one story, basmt., brick HOUSES, off Burney Lane, CINCINNATI, O. Nunlist & Frolicher, Tri-State Bldg., Cincinnati, O., engrs.

▲ Austin Co., 16112 Euclid, Cleveland, O., CA Est. $1,500,000, design and construct 86,000 sq. ft. Clothing PLANT addn., Kelley Ave. and East 39th St., CLEVELAND, O. Bobbie Brooks, Inc., 3830 Kelley, Cleveland, O.

Westinghouse Electric Co., 3 Gateway Center, Pittsburgh, Pa., CA $358,000, 4 TRANSFORMERS for Municipal Light-Plant, CLEVELAND, O. City, Dpt. P. Utilities, City Hall, Cleveland 14, O. Bids Feb. 6. CD 3/4, under LB.

▲ Leonard Ross, Chester-12th Bldg., Cleveland 14, O., CA Est. $1,000,000, 3 garden type APARTMENTS, 11849 Clifton Blvd., incl. parking, garage space; CA Est. $750,000, 5 story APARTMENT, Clifton Blvd. east of Fry Ave., LAKEWOOD, O. Lakewood Gardens, Inc., 418 Chester-12th Bldg., Cleveland 14, O. Phil Wasserstrom, 2nd fl., Chester-12th Bldg., Cleveland 14, O., archt.

▲ Schroeder & Sons, Inc., 2505 Schroeder Rd., Toledo, O., Owner Builds, $1,250,000, 56 HOMES, Richter Subdivision, across Maumee River from city, NAPOLEON, O.

Paul T. Koska, 6983 Big Creek Parkway, Cleveland 30, O., Owner Builds, $412,200, 18 ranch HOMES, Elizabeth Rd. in Olmsted Twp. at Eitch Rd., OLMSTED FALLS, O. Anderson & Dracon, 4517 Brookpark Rd., Cleveland 34, O., archts.

▲ Paul T. Koska, 6983 Big Creek Parkway, Cleveland 30, O., Owner Builds, $1,156,500, 45 ranch type HOMES, Whitney Rd., STRONGSVILLE, O. Anderson & Dracon, 4517 Brookpark Rd., Cleveland 34, O., archts.

▲ St. Louis Building Corp., 1130 Hampton Ave., St. Louis 10, Mo., CA Est. $1,750,000, design and construct 8-story OFFICE, Madison and Erie Sts., TOLEDO, O. Home Bldg. & Savings Assn., 902 Broadway, TOLEDO, O.

▲ Contemporary Constr. Co., Bellbrook, O., Owner Builds, $2,000,000, 80 one story HOMES, Sequoia site, WILMINGTON, O.

▲ Loving Bros., Inc., 529 E. Town St., Columbus, O., Owner Builds, $7,000,000, 480 HOMES and SHOPPING CENTER, WILMINGTON, O.

▲ E. W. Hauser Constr. Co., 1420 Commerce St., Indianapolis, Ind., LB $1,069,069, general contract 84-bed Howard County HOSPITAL, KOKOMO, IND. Trustees, Howard County Hospital, Courthouse, Kokomo, Ind. Bids Sept. 20. CD 8/26.

▲ F. A. Wilhelm Constr. Co., 3914 Prospect St., Indianapolis, Ind., CA $894,230, general contract SCIENCE BLDG., Sixth and Chestnut Sts., TERRE HAUTE, IND. Bd. Trustees, State Teachers College, Terre Haute, Ind. Bids Feb. 10. CD 1/15;
Christman Co., 1406 Wabash Ave., Terre Haute, Ind., CA $862,215, plumbing, heating, ventilation, science bldg. (Terre Haute, Ind.).

The Austin Co., 510 S. Dearborn St., Chicago, Ill., CA $400,000, 1 story, 37,800 sq. ft. magnet mfg. PLANT, State Rd. 2 and Evans Rd., VALPARAISO, IND. Indiana Steel Products Co., 405 Elm St., Valparaiso, Ind.

Fred Berglund, 8410 S. Chicago Ave., Chicago, Ill., CA $500,000, 3 story, 65x120 ft., steel, concrete CHEMICAL LABORATORY, 3336-56 E. 83 St., CHICAGO, ILL. United States Steel Co., 208 S. LaSalle St., Chicago 4, Ill. Naess & Murphy, 80 E. Jackson Blvd., Chicago 4, Ill., archts. Awarded Mar. 7. CD 3/19/56.

▲ A. L. Jackson Co., 310 W. Washington St., Chicago 6, Ill., CA $8,000,000, 25 story 600 room HOTEL addn., adjoining on north side, CHICAGO, ILL. Sheraton Hotel, 505 N. Michigan Ave., Chicago 11, Ill. Quinn & Christiansen, 134 N. LaSalle St., Chicago, Ill., archts. CD 12/4.

▲ E. W. Sproul Constr. Co., 173 W. Madison St., Chicago 2, Ill., CA $1,283,770, HOSPITAL BLDG. and NURSES RESIDENCE, MURPHYSBORO, ILL. St. Joseph Memorial Hospital, Murphysboro, Ill. Bids Dec. 15. CD 1/6, under LB.

▲ Collins Constr. Co., 3160 Fairfax, Kansas City 25, Mo., CA $1,300,000, TRUCKING TERMINAL, HOUSING for drivers and OPERATIONAL HEADQUARTERS, SUMMIT, ILL. General Expressways, 7230 W. 54 Ave., Summit, Ill. Earl A. Clark, Jr., 3160 Fairfax, Kansas City 25, Mo., archt. CD 7/24.

▲ Felmley-Dickerson Co., P.O. Box 38, Urbana, Ill., LB $7,859,788, ASSEMLBY HALL, URBANA, ILL. Bd. Trustees, University of Illinois, 256 Administration Bldg., Urbana, Ill. Bids Mar. 4. CD 2/27.

Theo. Utschig, 410½ W. College Ave., Appleton, Wis., LB $403,800, general contract HIGH SCHOOL and Elementary SCHOOL, MARKESAN, WIS. Joint School Dist. No. 3, Markesan, Wis. bids Feb. 26. CD 1/29.

▲ Permanent Constr. Co., 2200 N. 3 St., Milwaukee, Wis., CA $1,014,000, general contract Fulton JUNIOR HIGH SCHOOL, MILWAUKEE, WIS. Bd. School Directors, 1111 N. 10 St., Milwaukee 3, Wis. Bids Feb. 19, awarded Mar. 4. CD 2/25, under LB.

▲ A. Grignano, 802 E. Olin Ave., Madison, Wis., LB $1,677,000, general contract, SCHOOL and COTTAGES at School for Boys, WALES, WIS. State Dpt. P. Welfare, Madison, Wis. Bids Mar. 3. CD 1/22.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Minn., St. Paul—BA 3/24—City, City Hall, 10 mg. Highland Park water reservoir, Snelling Ave. between Highland Parkway and Ford Parkway, $600,000. Toltz, King, Duvall, Anderson & Assocs., Inc., 1408 Pioneer Bldg., St. Paul 1, Minn., engr. CD 11/10.

Minn., St. Louis Park—BA 3/30—City, City Hall, 34,000 lin. ft. sanitary sewers, lift station revisions, various streets. $700,000. Orr-Schelen, Inc., 1104 Currie Ave., Minneapolis, engr. CD 1/27.

Mo., Ellisville—BA 4/1—City, City Hall, sanitary sewerage sys., incl. 86,100 lin. ft. 8- to 15-in. sanitary sewers, 310 manholes, 5 lift stations, 13,800 lin. ft. 4- to 10-in. force mains, outfall sewers and sewage oxidation basins. $689,000. Plans deposit $25. Russell & Axon, 408 Olive St., St. Louis, Zone 2, engrs. CD 1/20.

† Iowa—BA 4/2—U. S. Eng., 1709 Jackson, Omaha 2, Neb., constr. and repair dikes and revetments, Missouri River Sioux City to Omaha at Lower Dakota Snyder Bends, vicinity of Salix, ENG-25-066-59-87. $640,000-$700,000.

† Tex., Dallas—AIR NATIONAL GUARD FACILITIES—BA 4/2—Officer in Charge Constr., 8th Naval Dist. Bldg. 16, U. S. Naval Station, New Orleans, (Algiers) La., air national guard facilities: grading, paving, drainage, aircraft washrack and utilities, Naval Air Station, NBy 22503, Spec. 22503/58. $500,000-$1,000,000.

▲† Colo., Denver—AIR BASE FACILITIES—BA 4/8—U. S. Eng., 1709 Jackson St., Omaha, Neb., WS-107 A2 technical facilities, Complex 1A, 1B, 1C Lowry Air Force Base, ICBM Titan Intercontinental Ballistic Missile Base, ENG-25-066-59-73. Extended date. CD 2/2.

† Iowa—BA 4/9—U. S. Eng., 1709 Jackson, Omaha, Neb. constr. and repair dikes and revetments Missouri River, Sioux City to Omaha Middle Tower Blenco Bends, vicinity of Blenco, ENG-25-066-59-88. $500,000-$600,000.

† Iowa—BA 4/9—U. S. Eng., 1709 Jackson, Omaha 2, Neb., constr. and repair dikes and revetments Missouri River, Sioux City to Omaha at Middle Little Sioux Reach-Bullard Bend, vicinity of River Sioux, ENG-25-066-59-89. $460,000-$550,000.

BUILDINGS—BA

Iowa, Adair—SCHOOL, etc.—BA 3/24—Adair-Casey School Dist., Adair, 39,600 sq. ft. high school and gymnasium, U. S. 6 and County Rd. J. in Guthrie Co., 4 mi. northwest from here. $485,000. Kurt Ketters Assocs., 202 Masonic Temple Bldg., Des Moines, archts. CD 10/8/57.

(Continued on page 242)

FRANK J. KNIGHT CO. GIVES NEW ERIE PAVING PLANT CREDIT FOR POURING 11 MILES OF CONCRETE HIGHWAY AHEAD OF TIME

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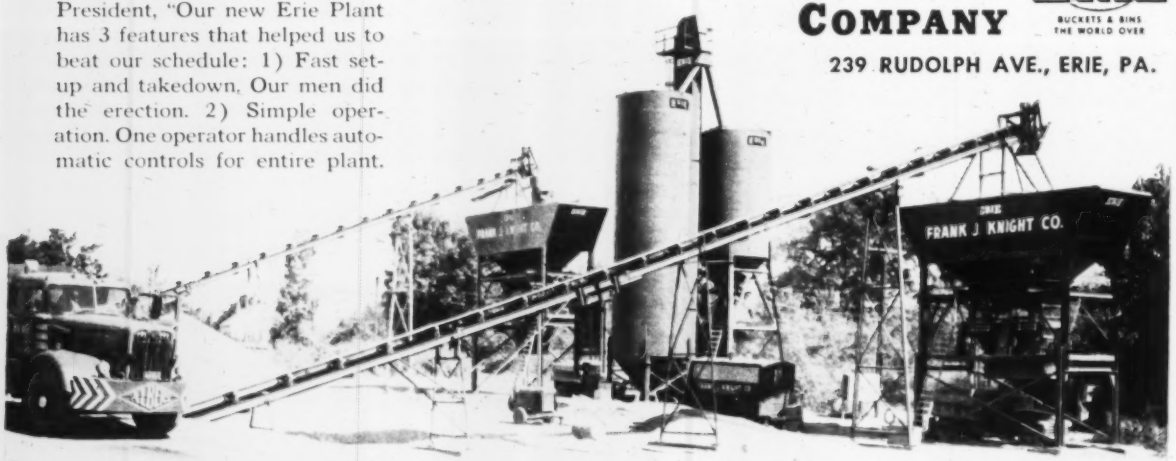

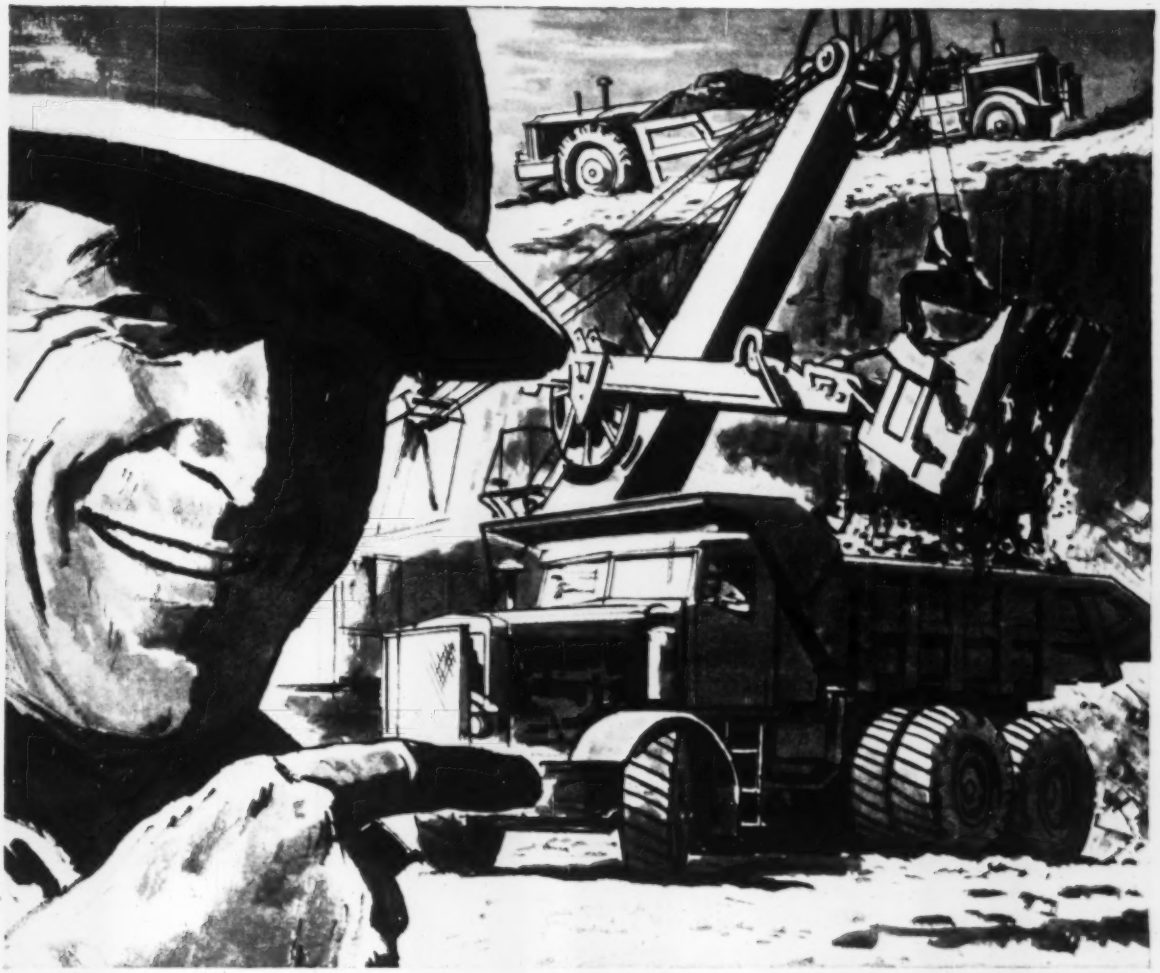

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(Continued from page 240)

▲† **Mo., Fort Leonard Wood**—HOUSING—BA 4/2—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., 700 Capehart housing units, incl. outside facilities, streets, parking, etc., Inv. IFB 59-44. CD 2/25.

▲ **Minn., Little Falls**—HOSPITAL—BA 4/7—St. Gabriel's Hospital, Sisters of St. Francis, (selected list bidders), general contract 34-bed hospital addn. $1,-500,000. Bettenburg, Townsend, Stolte & Comb, 1437 Marshall Ave., St. Paul, archts. CD 9/16.

† **N. M., Las Cruces**—HOUSING—BA About 4/14—U. S. Eng., P. O. Box 1538, Albuquerque, 251 single units, masonry, frame Capehart housing, utilities, White Sands Missile Range, ENG-29-005-59-65, CD 9/29.

BUILDINGS—SLC

▲ **Mo., Columbia**—DORMITORIES—Stephens College, E. Broadway and College, soon lets contract, two dormitories (A) 4 story, 59 x 122 ft brick, steel, concrete, etc. (B) 3 story, 60 x 146 ft. dormitory, CFA Proj. No. MO-23CH-45(D). Over $1,000,000. Murphy & Mackey, 6124 Enright Ave., St. Louis, Zone 12, archts. Neal Campbell, 911 Locust St., St. Louis, Zone 1, structural engr. Fred S. Dubin Assocs., 6124 Enright Ave., St. Louis, Zone 12, mechanical engrs. CD 3/4.

HEAVY CONSTRUCTION—LB & CA

MINNESOTA—State Hy. Dpt., Hy. Bldg., Capitol Grounds, St. Paul.

Duininck Bros. & Gilchrist, Olivia, Minn., CA $597,336, grav. base, road-mixed bit. base and bridges 1.5 mi. jct. and near Montevideo, Chippewa Co. Bids Feb. 27. CD 1/4, under LB.

Abbott, Arne & Schwindt, Inc., Box 542, Moorhead, Minn., LB $543,328 (7 bidders) sewage disposal sys., Sch. 1, interceptor sewers and force mains, EAST GRAND FORKS, MINN., City, City Hall, East Grand Forks, Minn. Bids Feb. 24. CD 2/4.

Barbarossa & Sons, Inc., 402 33rd Ave. N., St. Cloud, Minn., LB $259,000, Sch. 2, sewage lift stations (East Grand Forks, Minn.).

Dahlin Bros., Euclid, Minn., LB $182,920, Sch. 3, sewage lagoons (East Grand Forks, Minn.).

ARKANSAS—State Hy. Dpt., State Capitol, Little Rock, Bids opened 3/4.

Ark.—Mode & McCracken, Conway, Ark., LB $148,320 bridge, approaches Strawberry River on Hy. 115 4 mi. south of Smithville, Lawrence Co.

Ark.—Forsgren Brothers, 3023 N. 23, Fort Smith, Ark., LB $89,144, bridge, approaches, Kings River on Hy. 21 2 mi. south of its junction with Hy. 68, Madison Co.

Ark.—E. E. Barber Constr. Co., 722 Wheeler, Fort Smith, Ark., LB $300,171, bridge, approaches at Eleven Pt. River on Hy. 93, near Dalton, Randolph Co. CD 2/8 under Streets and Roads.

ARKANSAS—State Hy. Dpt., State Capitol, Little Rock, Bids opened 3/4.

Ark.—E. E. Barber Constr. Co., 722 Wheeler, Fort Smith, Ark., LB $218,963 (conc. pavement, LB inc. 1.1) 0.19 mi. Clarksville-Russellville Rd., St. Hy. 64, Johnson Co.

Ark.—Linwood Smith, Lake Village, Ark., LB $354,971 surf. and 2 bridges 9.585 mi. Jerome-McMillan County Rd., Hy. 144, Drew, Ashley and Chicot Counties.

Ark.—Ben M. Hogan Co., 1100 Fairview, Little Rock, Ark., LB $345,713 repair and resurf. 17.4 mi. US 79 from Stuttgart southerly to west city limits of White River Bridge, Clarendon, Prairie and Monroe Counties. CD 2/18.

▲† **Gunnar I. Johnson Co.**, 848 W. 74th St., Minneapolis, Minn., LB $957,922, (alt. $962,122, (10 bidders) dormitories, shop and fuel storage, Grand Forks Air Force Base, ENG-25-066-59-77, GRAND FORKS, N. D. Bids Feb. 26. CD 1/28.

Fred R. Comb, 2901 Aldrich Ave., Minneapolis, Minn., LB $239,533, (alt. $228,543 (10 bidders) Schedule No. 2 dormitories, shop and fuel storage, ENG-25-066-59-77, (Grand Fork, N. D.).

Richards & Assocs., Lancaster, Ga., LB $900,100, (3 alts.) AA on H frames electric transmission line, Anardarko, Okla. to Comanche, Okla. Anardarko Western Farmers Electric Cooperative, Anardarko, Okla. Bids Feb. 26. CD 2/18, 3/5.

▲† **General Services Admin.**, 1114 Commerce St., Dallas, Tex., rejected bids Oct. 17 for route traffic control center, 1,000 Amonautics Administration, KELLER, TEX. Est. $1,500,000. Will re-advertise. CD 10/10.

Walter Schubach, Contractor, 119 Lonta St., San Antonio, Tex., CA Est. $400,000, roller skating rink, SAN ANTONIO, TEX. North Gate Rollercade, Fred Clark, Lt. Col. Jerome A. McDavitt, 223 Rocolete Dr., San Antonio, Tex. CD 3/9.

COLORADO—State Hy. Dpt., 4201 East Arkansas, Denver.

Pioneer Constr. Co., 29 Lane and Hy. 96, Pueblo, Colo., CA $496,826, (alt. $460,000, structures, stabilization, sint. 2,373 m) Colorado Proj. No. F 017-2 (3), LB El Paso Co. Bids Mar. 5. CD 2/25.

BUILDINGS—LB & CA

▲ **Falk Constr. Co., Inc.**, 2240 Johnson St. N.E., Minneapolis, Minn., CA Est. $3,500,000, three 11-unit APARTMENTS, between N.E. 18th and 19th Aves. from Ulysses St. to Arthur St., MINNEAPOLIS, MINN. Windom Park Realtors, 2240 Johnson St. N.E., Minneapolis, Minn.

Walco, Inc., 2710 Nicollet Ave., Minneapolis, Minn., LB $477,400, Base Bid (9 bidders) general contract Jackson and Dwire HALLS addn., MINNEAPOLIS, MINN. Regents of the University of Minnesota, 404 Administration Bldg., Minneapolis 14, Minn. Bids Mar. 5. CD 2/11.

▲ **G. F. Cook Constr. Co.**, 2833 Lyndale Ave. South, Minneapolis, Minn., CA $1,500,000, 50 x 243 ft. FACTORY and 1 story, 202 x 684 ft. OFFICE, Valley Industrial Park, south of State Hy. 101 and C. & N. W. tracks, SHAKOPEE, MINN. Owens-Illinois Glass Co., Admin. Div., Eng. Dpt., 1700 N. Westwood Ave., Toledo, O. Bids Jan. 20. CD 1/21.

Cooper-Bessemer Corp., Mount Vernon, O., CA $763,260, 3,000-3,500 kw, etc., DIESEL ELECTRIC GENERATING UNIT, ESTHERVILLE, IOWA. City, City Hall, Esterville, Iowa. Bids Feb. 18. CD 3/2, under LB.

Voyles Constr. Co., 1503 Wells Ave., Richmond Heights 19, Mo., Owner Builds, $420,000, 10 one story DWELLINGS, Illinois and Wisconsin Aves., ST. LOUIS, MO.

Westlake Constr. Co., 1919 Railway Exchange Bldg., St. Louis 1, Mo., LB $636,200 (7 bidders), general contract 3 story, bsmnt., brick, concrete stone MEDICAL and BANK BLDG. in Northland Shopping Center, W. Florissant Ave., Lucas and Hunt Rds., JENNINGS (ST LOUIS 20 P.O.), MO. May Department Stores Co., 6057 Wilshire Blvd., Los Angeles 36, Calif. Bids Mar. 4. CD 2/18.

▲ **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., CA $9,000,000, Nuclear portion HALLAM NUCLEAR POWER PLANT, HALLAM, NEB. Consumers Pub. Power Dist. of Nebraska, 1452 25th Ave., Columbia, Neb. and the Atomic Energy Comm., Germantown, Md. Bechtel Corp., 220 Bush St., San Francisco, Calif., archts.-engrs. Atomics International, A Div. North American Aviation, Inc., 21600 Van Owen St., Canoga Park, Calif., engrs. on Nuclear Design. CD 4/24/58.

Meridian Shopping Center, Inc., Braniff Bldg., Oklahoma City, Okla., Owner Builds. Over $500,000, 80,000 sq. ft. SHOPPING CENTER, NW 16th and Meridian Sts., OKLAHOMA CITY, OKLA. Fred Pazezney, 1715 North Broadway, Oklahoma City Okla., archt.

▲ **Harmon Constr. Co.**, 300 S. Indiana, Oklahoma City, Okla., CA Est. $1,000,000, 84-room HOTEL, NW 11th and Shartel Ave., OKLAHOMA CITY, OKLA. Sonja Margo Hotel Corp., Inc., 1202 North Shartel, Oklahoma City, Okla. Bailey Boxalis, Dickinson & Roloff, Liberty Bank Bldg., Oklahoma City, archts. Awarded Mar. 3.

A. M. Lockett & Co., Ltd., Mercantile Dallas Bldg., Dallas, Tex. CA $508,200, CENTRAL WATER CHILLING STATION UNIT, AUSTIN, TEX. University of Texas Bd. Regents, Austin, Tex. Bids Feb. 17. CD 2/27, under LB.

▲ **H. B. Zachry Co.**, Box 10188, San Antonio, Tex., LB $4,416,415 (complete) Holly Street POWER PLANT and low water dam; LB $1,490,347, low water dam; LB $1,279,675, piping, AUSTIN, TEX. City, City Hall, Austin, Tex. Bids Mar. 9. CD 2/17.

Fisher Constr. Co., Box 6325, Houston, Tex., LB $1,-217,000, general constr. POWER PLANT (Austin, Tex.).

W. K. Jennings Electric Co., Inc., 2209 Chestnut St., Austin, Tex., LB $287,383, electrical work for POWER PLANT (Austin, Tex.).

Downey Bros. Contractors, 6925 Gulf Freeway, Houston, Tex., Owner Builds, $444,600, 43 low priced DWELLINGS; $402,000, 39 low priced DWELLINGS, BEAUMONT, TEX. CD 2/10.

Fox & Jacobs Constr. Co., Inc., 4926 Greenville St., Dallas, Tex., Owner Builds, $450,000, 18 DWELLINGS, north of N. W. Hy., DALLAS, TEX. CD 2/25.

D. W. Marshall Constr. Corp., Box 527, Victoria, Tex., LB $547,000, Base Bid, WAREHOUSE/SHOP, EL CAMPO, TEX. Gulfgate Congress & Warehouse Corp., c/o Caudill, Rowlett & Scott, archts.-engrs. 3400 Montrose Blvd., Houston 6, Tex. Bids Feb. 26. CD 2/18.

Rob E. McKee & Assocs., Box 562, El Paso, Tex., Owner Builds, $400,000, BANK, Chelmont Shopping area, EL PASO, TEX. CD 11/20.

Hallmark Builders, 2515 North Blvd., Houston, Tex., Owner Builds, $475,000, 38 DWELLINGS; $450,000, 36 DWELLINGS, Sun Valley, Pamela Heights-Briarpark Subdivisions, HOUSTON, TEX. CD 1/19.

Marvin Henry Builders, Inc., 7202 Leader St., Houston, Tex., Owner Builds, $435,125, 34 DWELLINGS; $412,-500, 35 DWELLINGS, Section 2 of "Sharpstown", HOUSTON, TEX. CD 1/26.

Rob W. Clemens, 401 S. Binney St., Houston, Tex., Purchase and Hire, $460,500, 22 DWELLINGS; $432,-100, 19 DWELLINGS, Meadowcreek Subdivision, HOUSTON, TEX. CD 2/11.

Rob H. Smith & Co., 3915 Kirby St., Houston, Tex., LB $727,000, (alt. $701,000 (1) DORMITORY (Student Facility (2) STUDENT UNION, 2 bldgs.) HOUSTON, Tex., Sacred Heart Dominican College, 2401 E. Holcombe Blvd., Houston, Tex. Bids Mar. 4. CD 2/26.

Downey Bros. Contractors, 6925 Gulf Freeway, Houston, Tex., Owner Builds, $419,100, 50 low priced DWELLINGS; $410,500, 48 low priced DWELLINGS, HOUSTON, TEX. CD 2/18.

J. S. Andrews Bldg. Co., 104 Phillips St., Dallas, Tex., Owner Builds, $462,950, 38 DWELLINGS; $437,500, 35 DWELLINGS, "Eastern Heights", MESQUITE, TEX. CD 2/27.

▲ **O. L. Olsen Co., Inc.**, 416 Pierce St., Houston, Tex., CA Est. $5,500,000, NATURAL GAS PLANT, 12 mi. 4 in. products lines; SHOP-STORAGE, ROCKPORT, TEX. Bay Petroleum Co., Subsidiary of Tennessee Gas Transmission Co., Tennessee Bldg., Houston, Tex. CD 10/15.

Ray Ellison Homes, Inc., Builder-Developer, Hy. 90 W., San Antonio, Tex., Owner Builds, $433,000, 40 DWELLINGS; $415,150, 38 DWELLINGS, Unit 7 exten., Lackland City, SAN ANTONIO, TEX. CD 2/6.

▲ **St. Anthony Hotel**, Travis and Navarro sts., San Antonio, Tex., Day Labor, $1,000,000, remodeling, refurnishing 1,100-room HOTEL, SAN ANTONIO, TEX. CD 3/5.

J. C. White, Park Addn., Wharton, Tex., CA Est. $800,-000, 80 bed HOSPITAL, WHARTON, TEX. Gulf Coast Medical Foundation, c/o Reber & Davidson, archts.-engrs., Box 407, Wharton, Tex. CD 12/4.

▲ **Mead & Mount Constr. Co.**, Denver Club Bldg., Denver, Colo., LB $1,137,500, 3 story bsmnt., 60,000-70,000 sq. ft. rein.-con. frame, LAW COLLEGE, 14 and Bannock, DENVER, COLO. University of Denver, Campus, Denver, Colo. Bids Mar. 5. CD 2/17.

Trautman & Shreve, Inc., 4406 Race, Denver, Colo., LB $539,425, 1 story, bsmnt., 49x73 ft. masonry, structural steel; DISTR. SYS. and BUILDING conversion, BOILER HOUSE and plant equipment, Central Heating Development Project, Phase B and C Project 550, Colorado State College, GREELEY, COLO. State Planning Division, State Capitol Bldg., Denver, Colo. Robert F. Linstedt, 625 W. 14 Ave., Denver, Colo., archt. Riley Engineering Corp., 810 23 St., Denver, Colo., consult. engrs. Johnson & Volland, 1357 Harland Denver, Colo., structural engrs.

▲ **Long Constr. Co.**, 1165 South Penn, Denver, Colo., LB $1,315,000, first phase, Westminster Plaza SHOPPING CENTER, W. 72 Ave. and Federal Blvd., WESTMINSTER, COLO. Dunton Realty Co., Westminster Plaza Co., 403 Midland Savings Bldg., Denver, Colo. Bids Mar. 3. CD 3/2.

† **Warner Constr. Co.**, P.O. Box 769, San Angelo, Tex., CA $660,231, SPECIAL WEAPONS ASSEMBLY FACILITY, White Sands Missile Range, ENG-29-005-59-76 B, LAS CRUCES, N. M. U. S. Eng., P.O. Box 1538, Albuquerque, N. M. Bids Feb. 18. CD 1/12.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
April 8 California

STREETS AND ROADS
April 8 California

▲ **Calif., Los Angeles**—BA 4/3—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 39, Cahuenga Blvd. and Vineland Ave., Storm Drain, rein.-con. pipe, $2,241,600. CD 11/10.

▲ **CALIFORNIA**—BA 4/7—Div. San Francisco Bay Toll Crossings, 761 Fremont St., San Francisco.

San Francisco Co.—Stillman St. Ramp, of San Francisco Oakland Bay Bridge reconstr., in San Francisco, $1,800,000.

Calif., Palos Verdes Estates—BA 4/7—City, 2512 Via Tejon, sanitary sewers, Assessment Dist. 2, 76,798 ft. 8 in. pipe, $994,167. South Bay Engr. Co., 43 Malaga Cove Plaza, engr. CD 2/10.

▲ **Calif., Oakland**—BA 5/8—East Bay Municipal Utility Dist., 2130 Adeline St., first 33 mi. 87 in. diam. 3rd aqueduct from Sierra Nevada to East Bay. CD 6/9.

BUILDINGS—BA

Calif., San Bruno—SCHOOL—BA 4/13—San Bruno Park Elementary School Dist., 500 Acacia Ave., steel frame, masonry John Muir Elementary School between Crestmoor Dr. and Skyline Blvd., $500,000. Plans deposit $50. Ernest Kump, 450 Ramona St., Palo Alto, archt. CD 7/18/56.

BUILDINGS—SLC

Calif., Los Angeles—SYNAGOGUE—Sinai Temple, c/o Sidney Eisenshtat, archt., 1145 S. Beverly Dr., soon lets contract rein. con. synagogue, Wilshire Blvd. and Holmby Ave. $750,000. CD 1/9/58.

▲ **Calif., Palm Springs**—HOTEL—Homer A. Rissman, archt., 1011 Swarthmore Ave., Pacific Palisades and Harold L. Epstein, structural engr., 140 S. Orlando Ave., Los Angeles, soon lets contract Palm Springs Riviera Hotel, for Mark S. Schulman, $1,000,000.

HEAVY CONSTRUCTION—LB & CA

† **ALASKA**—Bureau P. Rds., Federal Bldg., Juneau.

Gassland Co., Inc., 115 Ellis, Bellingham, Wash., CA $425,545, (est. $616,265 (7 bidders) c. conc. 1.0844 mi., Tongass Ave., Proj. F-095-1(13). Bids Mar. 3. CD 2/4.

† **Baker & Ford Co.**, 911 17 St., Bellingham, Wash., LB $836,475, (est. $2,163,840 (15 bidders) 3 ANTENNA foundations for ICBM detector station, Inv. 59-49, CLEAR, ALASKA. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids Mar. 5. CD 2/24.

† **Isaacson Iron Works**, 8531 E. Marginal Way, Seattle, Wash., CA $721,856, structural steel for Air Force Station, Inv. 59-63, CLEAR, ALASKA. U. S. Eng., 7022 Anchorage, Alaska. Bids Feb. 27. CD 3/4, under LB.

▲† **Peter Kiewit Sons, Inc.**, 1300 Alaska St., Seattle, Wash., CA $2,246,320, (est. $2,330,630) composite bldg., septic tank, outside utilities, roads and grading, removal existing bldg. and earthwork, Indian Mountain Air Force Station, Inv. 59-45, INDIAN MOUNTAIN, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. Bids Feb. 26, awarded Mar. 4. CD 3/4.

IDAHO—State Hy. Dpt., Boise.

Eagle Constr. Co., 3300 Pleasanton Ave., Boise, Idaho, CA $671,555, clearing, grubbing, grading, surf., draining 4.249 mi. Elk City Hy. in Nezperce National Forest, Idaho Forest Hy. Proj. 18 B2, C1, Idaho Co. Bids Feb. 26. CD 3/5, under LB.

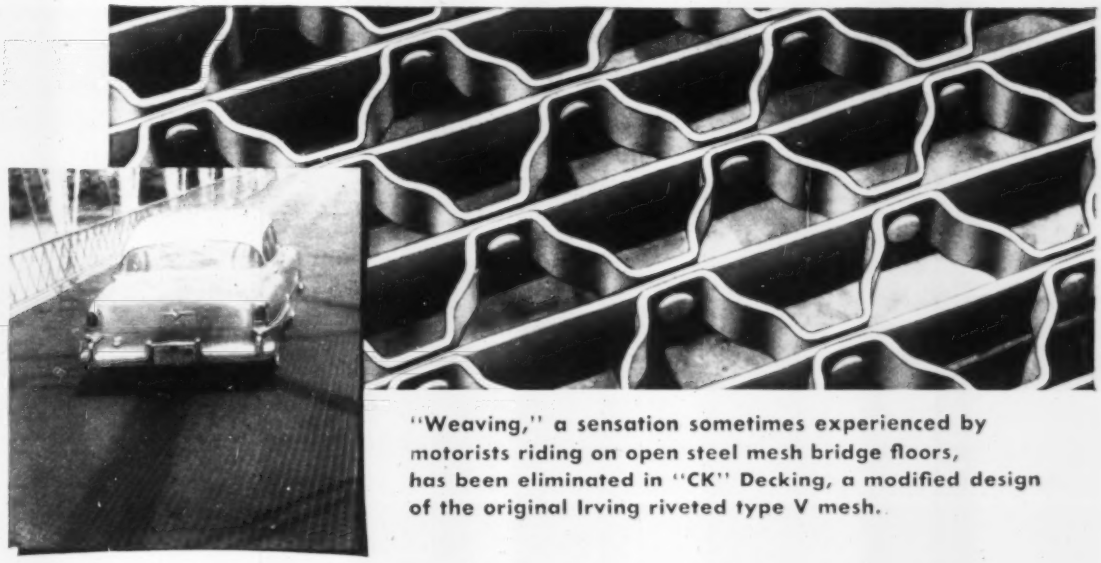
▲ **IDAHO**—State Hy. Dpt., Boise.

Cherf Bros., Inc., and **Sandkay Contractors, Inc.**, P.O. Box 938, Ephrata, Wash., CA $3,094,467, 4-lane divided roadway, plant mix bit. surf. and 4 concrete underpasses on 4.955 mi. Interstate No. 90, 0.425 mi.

(Continued on page 244)

NEW DECKING ENDS WEAVING ON BRIDGES

Field Tested "CK" Decking Gives Improved Riding Quality!



"Weaving," a sensation sometimes experienced by motorists riding on open steel mesh bridge floors, has been eliminated in "CK" Decking, a modified design of the original Irving riveted type V mesh.

THE DIFFERENCE between the "CK" design and the original design, is that the "CK" modification has all the crimped bars of the mesh raised $\frac{3}{16}$" above the straight bars. This simple change eliminates the tendency of vehicle wheels to follow the straight bars. It creates a more-open surface pattern which allows tires to sink deeper into the mesh for greater traction.

"CK" Decking has been field tested for over four years. County Commissioners in the test areas have stated that "CK" Decking gives improved riding quality under all types of traffic conditions and weather conditions.

ALSO HAS the ADVANTAGES of STANDARD DECKING

which has been giving outstanding service on bridges across the country for more than a quarter century. Those advantages include: safety, durability, maximum strength with minimum weight, self-drainage (won't collect snow or water), and minimum resistance to wind pressure.

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IRVING SUBWAY GRATING CO., Inc.

ORIGINATORS OF THE GRATING INDUSTRY – EST. 1902

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5063 27th St., LONG ISLAND CITY 1, N. Y.
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For location of the nearest Irving Sales Engineer consult your local Classified Telephone Directory in principal cities

(Continued from page 242)

U.S. 10, 0.092 U.S. 95, Kootenai Co. Bids Feb. 24, awarded Feb. 28. CD 3/3, under LB.

IDAHO—State Hy. Dpt., Boise,

Pickett & Nelson, Idaho Falls, Idaho, CA $561,762, plant mix bit. surf. and concrete railroad underpass on 0.377 mi. U.S. 30N, Bannock Co. Bids Feb. 24, awarded Feb. 28. CD 3/3, under LB.

T. L. Hanning & Assocs., 916 N.E. Webster St., Portland, Ore., CA $800,030, 28,200 ft. water supply line, EVERETT, WASH. City of Everett, City Hall, Everett, Wash. CD 3/3, under LB.

▲ OREGON—State Hy. Comm., Highway Bldg., Salem,

Ore.—Schrader Constr. Co., 3621 S.E. 52 Ave., Portland, Ore., CA $672,373 (11 bidders), combination Deschutes-Bronde River bridges and U.P. R.R. overcrossings, Ferry-Gro Dell section, Old Oregon Trail Hy., FAP I-80N-6-11(2)57, Union Co.;

Ore.—Peter Kiewit Sons Co., 215 S.W. St., Vancouver, Wash., CA $239,774 (7 bidders), two 4-lane overcrossing structures, Pacific Hy., FAP I-5-1(2)58, Josephine Co.;

Ore.—Bechtel Bros., LaGrande, Ore., CA $244,634 (19 bidders), 3 overcrossing structures, Old Oregon Trail Hy., FAP I-80N-6-16(2)50, Union Co.;

Ore.—Birkemeier Constr. Co., 14511 S.E. River Rd., Milwaukie, Ore., CA $270,762 (10 bidders) 381 ft. bridge over North Yamhill River, Pacific Hy. West, FAP F-122(12)7 Yamhill Co. Grand total $1,427,543. Bids Mar. 3, awarded Mar. 5. CD 2/28.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles. Bids opened 3/5,

Rice Bros., P. O. Box 886, Fresno, Calif., LB $517,741 (11 bidders) grade, surf. about 4.3 mi. and constr. rein.-con. bridge between Rte. 27 and 1.2 mi. south of Saldria. XI-Imp-187-B, Imperial Co. CD 2/6.

† William A. Drennan, 1325 Castaic Ave., Oildale, Calif., CA $441,800, (13 bidders) visitor center, Death Valley National Monument, CALIFORNIA and NEVADA, National Park Service, Dpt. Interior, 19 and C Sts. N.W., Wash. 25, D. C. CD 6/12/56.

▲† Griffith Co., 1060 South Broadway, Los Angeles, Calif., LB $3,850,655 (10 bidders) Los Angeles River imprvt., Soto to Randolph Sts., Los Angeles, ENG-04-353.59-23, CALIFORNIA. U.S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Bids Mar. 5. CD 2/3.

† Ray Kizer Constr. Co., 2990 S.W. Underwood Dr., Portland, Ore., LB $613,735 (16 bidders) earthwork, structures and surf. for relocation county road, Trinity County Rd., Ridgeville to Covington Hill, near Redding, Trinity River Div., Central Valley Proj. Spec. DC 5150, CALIFORNIA. Bureau Reclamation. Dpt. Interior, Lewiston, Calif. Bids Mar. 5. CD 1/29.

Geo. W. Peterson, 12610 Raymer St., North Hollywood, Calif., LB $557,458, 1-5 track bridge 38 ft. long, one 3-track bridge 38 ft. long, steel, concrete Nichols Ave. Underpass, FULLERTON, CALIF. City, 247 W. Commonwealth Ave., Fullerton, Calif. Bids Mar. 3. CD 10/21.

N. M. Saliba Globe Constr. Co. and B&P Trucking Co., 1590½ S. Broadway, Gardena, Calif. LB $867,079, est. $1,268,100. Proj. 55, Nichols Canyon Rd. storm drain, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar Sts., Los Angeles, Calif. Bids Mar. 6. CD 2/9.

Brunzell Constr. Co., 1945 Higuera St., Culver City, Calif., CA $720,983 (14 bidders), rein.-con. football stadium, NORWALK, CALIF. Cerritos Junior College Dist., 11162 E. Alondra Blvd., Norwalk, Calif. Bids Mar. 3, awarded Mar. 4. CD 2/17.

▲ Vinson Constr. Co., 1920 W. Grant Rd., Phoenix, Ariz., LB $1,555,973 (5 bidders), sanitary sewers, raw sewage pumping station, sewage treatment plant, RIVERSIDE, CALIF. Jurupa Community Services Dist., 8520 Donna Way, Riverside, Calif. Bids Mar. 9. CD 2/27.

▲ John M. King Co., 1601 Taylor Way, Tacoma, Wash. LB $1,552,194 (8 bidders), Contr. 325, transmission line between Moccasin and Station "O", Canyon Cherry Power Development, SAN FRANCISCO, CALIF. City and San Francisco County, Pub. Utilities Comn., City Hall, San Francisco, Calif. CD 11/11/55.

BUILDINGS—LB & CA

Howard Constr. Co., Box 411, Murray, Utah, CA $535,850, est. $465,000, ELEMENTARY SCHOOL, TOOELE, UTAH. Tooele Co. Bd. Educ., Tooele, Utah. Bids Mar. 3. CD 2/11.

▲ A. Brown, 628 Dooly Bldg., Salt Lake City, Utah, CA $2,341,696, STATE OFFICE N.E. of Capitol or at downtown site, SALT LAKE CITY, UTAH. State Bldg. Bd., 419 State Capitol, Salt Lake City, Utah. Bids Feb. 6. CD 2/11, under LB.

Glacier Constr. Co., 5516 Corliston Rd., Seattle, Wash., CA $505,769 (10 bidders), general contract, 1 story, 57,000 sq. ft. steel JUNIOR HIGH SCHOOL, SNOHOMISH, WASH. School Dist. 201, Snohomish, Wash. Bids Mar. 5. CD 2/20.

Jill Homes, Inc., 435 N. Robertson Blvd., Beverly Hills, Calif., CA $535,000, 50 stucco DWELLINGS, Eccles St., Chase St. and Nevada Ave., CANOGA PARK, CALIF. Lapadale Realty Co., 269 N. Robertson Blvd., Beverly Hills, Calif. Wm. H. Bras, 962 N. La Cienega Blvd., Los Angeles, Calif., archt.

† Rock Constr. Co., P. O. Box 783, Stockton, Calif., LB $594,890 (5 bidders), 4 BUILDINGS, accesses roads, LIVERMORE, CALIF. U. S. Atomic Energy Comn., Eng. Div., S.F. Operations Office, 518 17th St., Oakland, Calif.

Payne Constr. Co., 689 Louisiana St., Oakland, Calif., LB $392,282 (8 bidders), 11,000 sq. ft. addn., CHEMISTRY LABORATORY COMPLEX BLDG. W.ING, Increment 4, (Livermore, Calif.)

▲ Brown Boveri Corp., Baden, Switzerland, CA $9,260,800, two 200,000 kw GENERATORS for Haynes Steam Plant, Los Alamitos, LOS ANGELES, CALIF. Los Angeles Water & Power Dpt., 311 S. Spring St., Los Angeles, Calif. Awarded Mar. 4. CD 3/3, under LB.

Donald Shaw Builders, 1901 Blake St., Los Angeles, Calif., CA $448,000, 156,800 sq. ft. steel frame, concrete PAPER CONTAINER MANUFACTURING addn., 4240 E. Bandini Blvd., LOS ANGELES, CALIF. National Paper Corp., 4240 E. Bandini Blvd., Los Angeles, Calif. David R. Edwards, 5911 Pine Ave., Maywood, Calif., engr.

▲ Twaits-Wittenberg Co. & Morrison-Knudsen Co. Inc., 507 S. Bixel St., Los Angeles, Calif., CA $11,464,000, multi story HALL OF RECORDS BLDG., Los Angeles Civic Center, 320 W. Temple St., Spec. 1805-G, LOS ANGELES, CALIF. Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, Calif. Bids Jan. 14. CD 1/19, under LB.

Petroleum Combustion & Eng. Co., 11941 Wilshire Blvd., Los Angeles, Calif., LB $491,885 (7 bidders), ENVIRONMENTAL TEST LABORATORY FACILITIES TEST EQUIPMENT, Spec. 5049, NIMBUS, CALIF. Aerojet-General Corp., Archt.-Engr. Div., P. O. Box 1947, Sacramento, Calif.

Robert E. L. Parker Co., P. O. Box 192, Claremont, Calif., LB $401,804 (7 bidders), INSTRUMENTATION and CONTROL BLDG. and temperature conditioning complex, Spec. 5633 (clearing, grading, earthwork, concrete work, structures, etc.), NIMBUS, CALIF. Aerojet-General Corp., Archt.-Engr. Div., P. O. Box 1947, Sacramento, Calif.

Austin Co., 777 E. Washington Blvd., Los Angeles, Calif. CA $600,000, 80,000 sq. ft. tilt-up WAREHOUSE and OFFICE, POMONA, CALIF. Burlington Industries, Inc., 2300 W. Valley Blvd., Pomona, Calif. Austin Co., 777 E. Washington Blvd., Los Angeles, Calif., engr.

▲ Berlin Constr. Co., Box 1500, Poway, Calif. CA $1,250,000, 116 DWELLINGS, Frame Rd. and Powers Rd., POWAY, CALIF. Morine Bldg. Corp., Box 1500, Poway, Calif.

Charles C. Richardson Constr. Co., Box 17008, San Diego, Calif., CA $923,500, frame, stucco 28,932 sq. ft. MOTEL, 5550 Kearny Mesa Rd. Lot 78, SAN DIEGO, CALIF. George Symon & Irvin J. Kahn, 920 Bank of America Bldg., San Diego, Calif.

Arntz Constr. Co., 1745 Filbert St., San Francisco, Calif., LB $558,563, Consolidate LABORATORIES, San Francisco General Hospital, Job 1696, SAN FRANCISCO, CALIF. City and San Francisco County, City Hall, San Francisco, Calif. CD 12/5/54.

▲ Hight Constr. Co., 4344 Eagle Rock Blvd., Los Angeles, Calif., CA $1,332,000, 4 Santa Monica HIGH SCHOOL BLDGS., SANTA MONICA, CALIF. Santa Monica Unified School Dist., 1723 4th St., Santa Monica, Calif. Bids Mar. 9. CD 2/20.

Bollenbacker & Kelton, Inc., 5447 El Cajon Blvd., San Diego, Calif. Owner Builds, $472,360, 56 frame DWELLINGS, Elkton Blvd., Lockard St. & Spring Valley Homes Tract, SPRING VALLEY, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 26 British Columbia — April 9 Alberta
April 15 Ontario

BUILDINGS—BA

▲ Ont., Dundas—SCHOOL—BA 3/23—Bd. Educ., Dundas, 2 story high school, $3,000,000. Kyles & Kyles, 247 John St. S., Hamilton, archts. CD 12/31.

Ont., Tillsonburg—SCHOOL—BA 3/31—Tillsonburg District High School Bd., R.R. 1, Courtland, part 1 and part 2 story, 160 x 200 ft. precast concrete frame, brick, masonry high school, $600,000. Plans deposit $50. Blackwell & Hagerty, 310 Princess Ave., London, archts. M. M. Dillon & Co. Ltd., 141 Maple St., London, engrs. CD 3/14/56.

HEAVY CONSTRUCTION—LB & CA

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria. Bids opened 2/26,

McClay Constr. Co. Ltd., 1196 E. Pender, Vancouver, B. C., LB $428,167, 4.76 mi. Lougheed Hy., Seabird Bluffs-Ruby Creek. CD 2/19.

Louis Donolo, Inc., 8120 St. Lawrence Blvd., Montreal, Que., CA $812,339, Standard Maritime Readiness Hangar and Standard Maritime Anti-Corrosion Hangar, Royal Canadian Air Force Station, GREENWOOD, N. S. Defense Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Feb. 12, awarded Mar. 3. CD 2/20, under LB.

▲ ONTARIO—Dpt. P. Wks., Hunter Bldg., Ottawa,

Bridge & Tank of Canada Ltd., Box 325, Hamilton, Ont., CA $3,684,395, superstructure Burlington Canal Lift Bridge over Burlington Channel entrance to Hamilton Harbour, Hamilton. Bids Feb. 3, awarded Mar. 4. CD 2/10, under LB.

▲ ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto.

Peel Constr. Co. Ltd., Box 1000, Brampton, Ont.; CA $1,488,353, granular base, c. conc. paving, hot mix paving 8.4 mi. Hy. 401 from Hy. 25 easterly, Toronto. Awarded Mar. 6. CD 3/11, under LB.

Newman Bros. Ltd., 4A Clark St., Box 193, St. Catherines, Ont., LB $414,994, inspection canopy, Canadian Plaza, Peace Bridge, FORT ERIE, ONT. Buffalo & Fort Erie Public Bridge Authority, Peace Bridge, Canadian Plaza, Fort Erie, Ont. and Buffalo, N. Y. W. L. Somerville, McMurrich & Oxley, 191 Eglinton Ave. E., Toronto, Ont., archts. S. S. Vazaris, 4105 Dundas St. W., Toronto, Ont., engr. CD 10/28/54.

Westeel Products Ltd., 1 Atlantic St., Toronto, Ont. LB $154,604, inspection booths, Canadian Plaza Peace Bridge (Fort Erie, Ont.).

Canadian Dredge & Dock Co. Ltd., 60 Harbour St., Toronto, Ont., LB $547,762 (18 bidders) harbor repairs and imprvs., HAMILTON, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. CD 9/25/56.

BUILDINGS—LB & CA

▲ Marwell Constr. Co. Ltd., 1500 W. Georgia St., Vancouver, B. C., CA $2,000,000, concrete, brick HOTEL, BANK, SUPERMARKET, SERVICE STATION and Samil Boat Marina, CAMPBELL RIVER, B. C. Tyee Plaza Development Co. Ltd., c/o 1500 W. Georgia St., Vancouver, B. C. Awarded Mar. 4.

Commonwealth Constr. Co. Ltd., 700 Taylor St., Vancouver, B. C., CA $500,000, 200x300 ft. and 100x100 ft. concrete block OFFICE and VEGETABLE HANDLING BLDGS., RICHMOND, B. C. B. C. Coast Vegetable Marketing Bd., 405 Railway St., Vancouver, B. C. Commonwealth Constr. Co. Ltd., 700 Taylor St., Vancouver, B. C., engrs. Awarded Mar. 5.

Northern Constr. Co. & J. W. Stewart Ltd., 1304 Hornby St., Vancouver, B. C., LB $728,500, 1,000,000 bu. GRAIN ELEVATOR addn., VANCOUVER, B. C. Canadian Govt., Ottawa, Ont. Sandwell & Co., Ltd., 1512 Alberni, Vancouver, B. C., engrs. CD 7/31/50, under Unclassified.

National Constr. Ltd., 111 Phoenix Bldg., Winnipeg, Man., CA $500,000, 5 story, rein.-con. APARTMENT, south of River Rd., WINNIPEG, MAN. Goldberg, Rosenberg, & Co., c/o 111 Phoenix Bldg., Winnipeg, Man. Kurarsky & Weinberg, 406 Montreal Trust Bldg., Winnipeg, Man., archts. Awarded Mar. 4.

Angus Robertson Ltd., 5035 Western Ave., Montreal, Que., CA $603,000, OFFICE for Dpt. Insurance, Riverside Dr., OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Feb. 4, awarded Mar. 3. CD 2/11, under LB.

▲ Carter Constr. Co. Ltd., 419 Cherry St., Toronto, Ont., CA $1,600,000 (8 bidders) superstructure 3 story, rein.-con. Pool Elevator No. 3 Addn., PORT ARTHUR, ONT. Manitoba Pool Elevators, Wheat Pool Bldg., Winnipeg, Man. Bids Mar. 2, awarded Mar. 3. CD 2/27.

▲ Angus Robertson Ltd., 57 Bloor St. W., Toronto, Ont., CA (8 bidders), 3 wing, 6 story NURSES RESIDENCE addn., 41x150 ft., 41x54 ft., 56x100 ft., connected by tunnel to main hospital, TORONTO, ONT. Hospital for Sick Children, University Ave., Toronto, Ont. Bids Feb. 27. CD 2/16.

Dravo Constr. Ltd., 159 Bay St., Toronto, Ont. LB $682,668 (9 bidders) 108 unit, BROCKTON PARK APARTMENTS, 1525 Dundas St. W., TORONTO, ONT. Housing Authority of Toronto, 415 Gerrard St. E., Toronto, Ont. J. E. Hoare, 481 Eglinton Ave. W., Toronto, Ont., archt. Bids Mar. 4. CD 2/12.

DuBarry Holding Corp., 1010 St. Catherine St. W., Montreal, Que., Owner Builds, $900,000, eight 3 story, brick, stone APARTMENT BLOCKS, Delmar Ave., MONTREAL, QUE. Emilien Bolduc, 6746 Molson St., Montreal, Que., archt.

Acme Enterprises Ltd., 4357 Chapleau St., Montreal, Que., CA Est. $800,000, 22 HOUSING, Morrice and Viel Sts., MONTREAL, QUE. L. Frascarelli, c/o contractor, Ronco & Belanger, 172 Belanger St. E., Montreal, Que., archts. Awarded Mar. 4.

▲ Conde Cie Ltee, 7011 St. Denis St., Montreal, Que., CA $1,674,773, 3 story, bsmnt., concrete, rein.-con. brick, stone CLASSICAL COLLEGE, Bois de Boulogne Ave., MONTREAL, QUE. La Corporation du College St. Paul, 2381 Gouin Blvd., Montreal, Que. Bids Feb. 18, awarded Mar. 3. CD 2/27, under LB.

Magil Constr. Ltd., 410 Gratton St., St. Laurent, Que., LB $439,500 (11 bidders) McLeardon SCHOOL, MONTREAL, QUE. Protestant Bd. of School Comrs., 3460 McTavish St., Montreal, Que. Comber, Comber & Mack, 4493 Sherbrooke St. W., Montreal, Que., archts. Henry Jasen, 140 Guy St., Montreal, Que. engr.

C. John Ltee., 1130 Vincent Massey St., Quebec City, Que., CA $758,923, SCHOOL and INDIAN RESIDENTIAL DORMITORY, POINTE BLEUE, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. CD 1/21, under LB.

▲ Moquin & Kindler, Inc., 2360 Lucerne Rd., Mount Royal, Que., CA Est. $4,500,000, brick HOUSING concrete fdn., Gouin Blvd. W., STE GENEVIEVE DE PIERREFONDS, QUE. Pierrefonds Estates Regd., c/o contractor, Thibodeau & Thibodeau, 940 Cote de Liesse Rd., Mount Royal, Que., archts.

A. Janin Cie Ltee, 7085 Cote des Nieges Rd., Montreal, Que., CA Est. $500,000, 1 story, structural steel frame REFRIGERATED WAREHOUSE, SHERRINGTON, QUE. Societe des Cultures des Terres Notres, c/o contractor, A. Leslie Perry, 1434 St. Catherine St. W., Montreal, Que., archt. Awarded Mar. 3.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

† PANAMA—Inter-American Hy. Office, Dpt. Commerce, Wash., D. C., rejected bids Jan. 14, Section 2 on Inter-American Highway from David to Laponcepcion, Panama Proj. 13. CD 1/22.

BUILDINGS—LB & CA

▲ Koppers International C. A. sub Koppers Co. Inc., Koppers Bldg., Pittsburgh 19, Pa., CA Est. $17,000,000, ethylene and polyethylene PLANT, near BUENOS AIRES, ARGENTINA. Industrias Plasticas Argentinas Koppers, S. A.

(Proposal Advertisements see pp. 264 to 266)

Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Feb. 26; Next, Mar. 25.
- Cement Aggregates, Ready-mixed Concrete, Asphalt: Last, Mar. 5; Next, Apr. 9.
- Wage Rates, Building Board, Lath, Insulation: Last, Feb. 26; Next, Mar. 26.
- Iron & Steel Products, Pipe: Last, Mar. 12; Next, Apr. 16.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Fox. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

		1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 12x12 Rgh	FIR PLYWOOD ¼" Interior plyscored, C-D gr.	FIR PLYWOOD ¼" Plyform grade*
Atlanta	n†	$73 00	$76 00	$76 00	$79 00	$81 00	$86 00	$136 00			$121 00	$156 00	$135 00	$216 00
Baltimore	c	95 00	100 00	102 00	102 00	102 00	107 00	119 00			175 00	190 00	175 00	260 00
		118 00g	118 00g	128 00g	128 00g	128 00g	138 00g	139 00g	$165 00	$155 00				
Birmingham	n†c	80 00	82 00	79 00	82 00	85 00	90 00	105 00			115 00	160 00	138 29	246 94
		50 50	50 50	50 50	58 00	58 00	88 00	28 50	50 50	50 50				
Boston	ns	98 00f	99 00f	107 00f	107 00f	107 00f	107 00f						180 00	250 00k
		50 00	50 00	115 00	115 00	115 00	115 00	190 00	158 00	158 00				
Chicago	**	116 00	119 00	113 00	127 00	135 00	136 00	131 00			159 00	159 00	168 00	278 00
		132 00	132 00	135 00	135 00	135 00	181 00	142 00	142 00					
Cincinnati	n*	99 50	100 75	93 50	95 00	101 75	109 75	121 00			138 00	135 00	110 00f	210 00f
		100 50	102 50	105 50	106 50	105 50	122 50	136 50	136 50	136 50				
Cleveland	n*	90 00	92 00	97 00	98 00	100 00	105 00						139 00a	215 00a
				104 00	105 00	105 00	118 00	121 00	121 00	121 00				
Dallas	‡	74 50k	74 50k	72 00k	72 00k	74 50k	75 50k	120 00k			130 00	125 00	112 50ac	196 00ac
Denver	n*	Not in stock		109 00	110 00	110 00	118 00	136 00	128 50	158 50				
Detroit	‡	120 00	122 50	120 00	128 00	135 50	125 50				143 50		180 00g	285 00g
		190 00	190 00	195 00	195 00	195 00	201 00	221 00	221 00					
Kansas City	fn	125 00	125 00	125 00	130 00	135 00	145 00						162 75	216 75
		135 00	135 00	135 00	140 00	135 00	185 00	165 00	225 00	225 00				
Los Angeles	ns	102 00	102 00	102 00	102 00	102 00	102 00	150 00	155 00	155 00			140 00	235 00
Minneapolis	n	185 00m	185 00m	185 00	185 00	185 00	185 00	185 00	185 00	185 00			190 00	310 00
Montreal	*bpc	87 00a	94 00a	87 00a	88 00a	104 00a	128 00a				122 00	122 00	119 25	225 95
		105 00	105 00	105 00	105 00	105 00	165 00	170 00	170 00	170 00				
New Orleans	fn	89 00	89 00	95 00	92 00	92 00	97 00	126 00			122 00	109 00	122 11	201 00
		118 00	118 00	127 00	124 00	124 00	129 00	140 00	140 00	140 00				
New York	f	115 00	117 00	124 00	124 00	124 00	129 00	245 00			245 00	255 00	139 20a	215 60a
				125 00	125 00	125 00	127 00	269 00	269 00	269 00				
Philadelphia	‡n		Range from 112 132				117 137	117 137			226 236	226 236	145 00h	260 00h
			Range from 132 132				127 137	137 137	158 00	158 00				
Pittsburgh	n*	115 00	120 00	130 00	120 00	125 00	130 00	150 00			150 00	185 00	190 00	295 00
		120 00	120 00	130 00m	130 00	130 00	130 00	220 00	185 00	185 00				
St. Louis	lne	125 00	127 00	135 00d	135 00d	135 00d	140 00d						185 02ach	290 02Rachi
				128 00a	128 00a	128 00a	128 00a	197 00a	197 00a	197 00a	.....	.....		
San Francisco	n	88 00	88 00	88 00	92 00	92 00	98 00	165 00	120 00	120 00			110 00h	210 00h
Seattle	†	68 00	70 00	75 00	75 00	75 00	75 00	88 00	95 00	95 00			122 00acg	230 00acg
Toronto	*	92 50a	93 50a	93 75a	86 00a	89 00	89 00a	99 00a			90 00a		235 50	290 00
		108 00	108 00	112 00	106 00	122 00	122 00	138 00	151 00	151 00				

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL.

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. •a Spruce. •b Federal tax exempt, add 6% mun. & prov. tax. •c 5M lots. •d 8, 10, & 12 ft. lengths. •e 8 to 16 ft. lengths. •f Hemlock. •g No. 1 common. •j 8 ft. lengths. •k No. 3 common. •l Add 2% sales tax. •m Up to 16'; No. 3 western pine, $125. •n Less 2% disc. 10 days. •o Less 2% disc. 10th. •p Less 1% disc. 10 days. • q fir: $80.25 in truck lots, fob job or CL, f.o.b. city. •r for f.o.b. city price add $8 for pine, $35 for fir. •s asd trucklots 5.6 Mfbm. •t trucklots del. •u Retail LCL yard. •v Retail LCL, del. •w add 6% Mun. & Prov. tax.

* PLYWOOD (Plyform, oiled and edge sealed; Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistance, ¾", $186.00; ¾", $206.00 Exterior, waterproof, ¾" $190.00; ¾", $210.00. •a Delivered. •b Price may increase this month. •c Truck lots. •d A-C exterior. •e LCL. •f less 1%, 5 days. •g less 2% for cash. •h less 2% disc, 10 days. •j add 2% sales tax.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers' list, Feb. 1, 1950a Single or Double Strength A quality	WINDOW GLASS Discounts from jobbers' list, Feb. 1, 1950a Single or Double Strength B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 500 lb. lots*
Atlanta	79%cR	79%k	$0.2615
Baltimore	74%d	76%d	.2615
Birmingham	82%f	82%f	.2265
Boston	72-10%m	72-10%m	.2615
Chicago	72%	72%	.2265
Cincinnati	74%	74%	.2615
Cleveland	74-2-10%	74-2-10%	.2615
Dallas	76%	76%	.2690
Denver	73.5%	73.5%	.2615
Detroit	74-10-10%	74-10-10%	.2615
Kansas City	76-10-10%	76-10-10%	.2615
Los Angeles	70%	76%e	.2610
Minneapolis	71-10%	71-10%	.2615
Montreal	40-10-5%br	40-10-5%	23.20h
New Orleans	76%a	76%a	.2615
New York	79%j	79%j	40g
Philadelphia	76-10%n	76-10%n	.2615
Pittsburgh	72%	72%	.2615
St. Louis	72-10-10%mo	72-10-10%mo	.2615
San Francisco	80%	73%	.2615
Seattle	$8.85 11.55k	$6.41 8.67k	.2615
Toronto	2-10-10-65n	6-15-9-70n	

Prize of 40% Ammonia Gelatin is $0.15 per lb. higher than 40% to U. S., $1.75 per 100 lbs. higher in Canada.

Glass: •a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. •b sales tax extra. •c 77½ for single strength. •d From 6.15.52 list. •e 77½ for double strength. •f Single strength; double strength, 83⅓. •g From 8.1.58 list. •h Ss, ds, 40-in. •j 20 boxes min. •k eff. 12.58. •l eff. 10.15.58. •m less 2% disc. 10 days. •n less 1% disc, 10 days. •o add 2% sales tax.

Explosives: * Cartridges of 1¼" diameter or over, in standard lengths. •g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. •h F.o.b. Beloeil (near Montreal), per 100 lb., lots under 2000, wood cases, forcite, 40% Forcite 60%, $23.80; in fiber cases: forcite 40%, $23.20; forcite 60%, $24.95.

40% Ammonia Gelatin price ranges in other than urban areas, per lb, (except Seismograph Grades):

	C.L. 30,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.2015	$0.2065	$0.2165	$0.2615
Group 2*	.2060	.2110	.2210	.2660

* All areas except those in Group 2 and N. J. cities of Bayone, Hoboken, Jersey City, No. Bergen, Union City and Weehawken. * Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucie and south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan, Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in. 2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in. 2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in. 2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in. 3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in. 2-ft. from butt	6-in.	50 to 69-ft.	.50/68	....
14-in. 2-ft. from butt	6-in.	70 to 79-ft.	.78/88	.93
14-in. 2-ft. from butt	5-in.	80 to 84-ft.	.88/93	94
14-in. 2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in. 2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		8" x 8" x 8' Untr.	8" x 8" x 8' Tr.	7" x 8" x 8'6" Gr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5	$2.25	$3.33
	Grade 2	1.50	2.35	" 4	2.10	3.18
	Grade 1	1.15	2.00	" 3a	1.70	2.78
Chicago	Red Oak		3.80a			4.40a
New York	S. L. Sap Pine	2.50	4.00		3.00	5.00
	Mixed Oak	2.50	4.00		3.00	5.00
Philadelphia	Red Oak	2.85 4.05	4.40 4.60		3.20 3.40	4.40 4.60
St. Louis	Mixed Oak	2.65	3.40a		2.90h	3.75ah
San Francisco	Douglas Fir	2.12e	3.10e		2.90e	4.52e

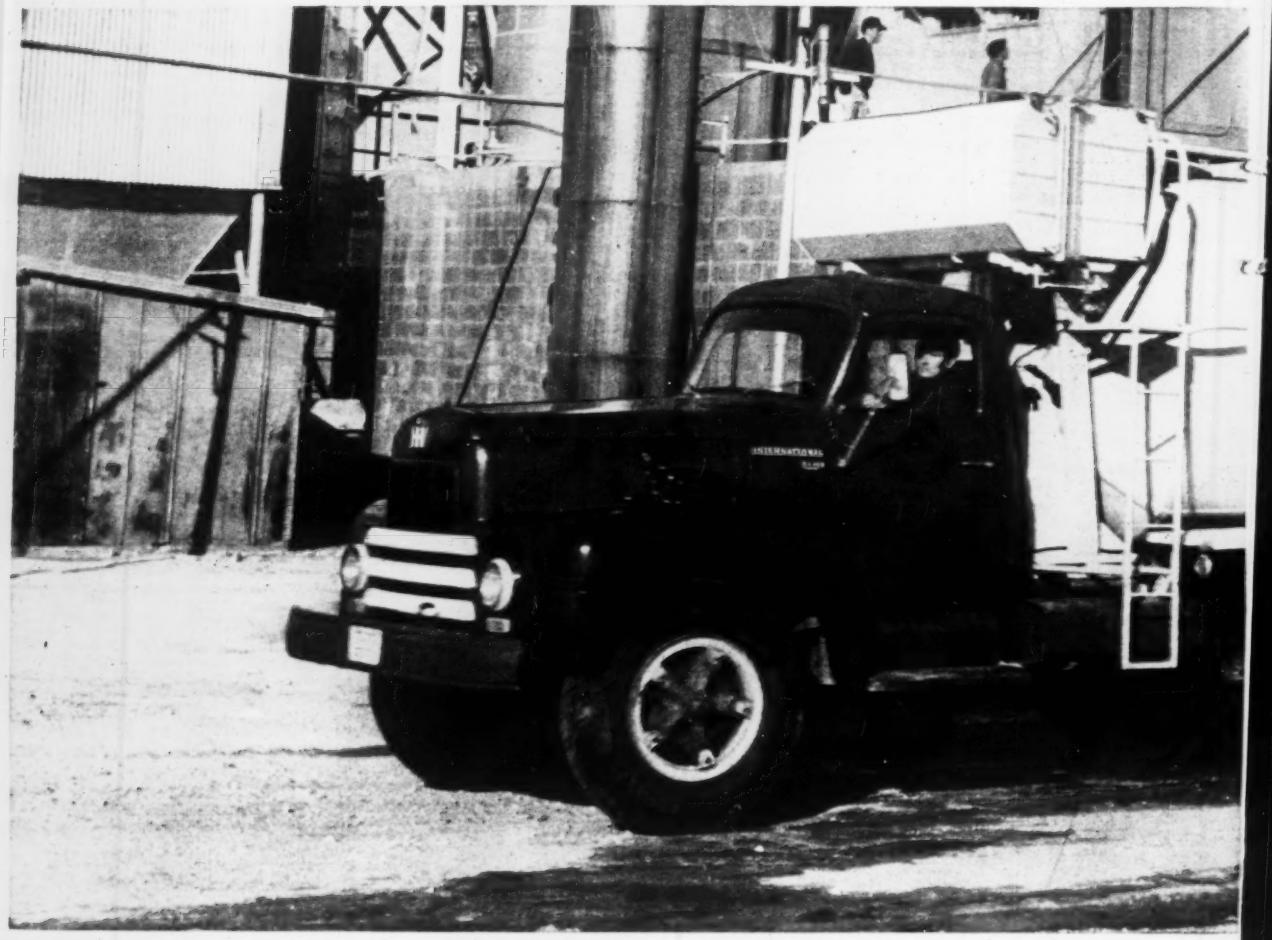
Tr., Treated; Untr., Untreated. a Creosoted. e Empty cell. f Green f.o.b. cars. g 7 x 9 x 8'6". * Add 75¢ tie freight charge to Birmingham. •h 7" x 9" x 9'6".

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	31.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.60
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	2.05
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	21.20

There's an International



Light loads or heavy loads, this INTERNATIONAL model RF-190 six-wheeler has the versatility to take 'em and keep operating costs down doing it. There are optional front axles to 15,000 lbs., 13 different rear axle ratios with up to 34,000 lbs. of capacity—and a range of high-displacement six-cylinder engines up to 501 cu. in. A standard differential lock-out, heavy-duty suspension and optional power steering make this truck the "work horse" of any fleet!

Save hundreds of dollars on first cost! Compact-design INTERNATIONAL Truck slices bumper-to-back-of-cab dimension to 96 inches for maximum maneuverability . . . slices operating costs, too, with an economical 6-cylinder engine and matched driveline that makes a perfectly balanced unit for the job. Select-O-Matic transmission options provide smooth application of power no matter what the conditions—eliminate shock-load to rear axle. Full depth channel-type frame and husky components back up GVW rating at 33,000 lbs.

Tough...there's no other word for it! This INTERNATIONAL Truck model RF-230 is built for keeps to keep *big* deliveries on the move. With its deep-flange, channel-lined, full depth frame and standard 15,000 lb. front axle – 50,000 lb. bogie, it "walks" 10-yard-plus loads over pock-marked terrain or hustles down the highway with no strain. What's more, you can get a 501 cu. in. displacement engine (444 pound-feet of engine torque) working through up to 190-to-1 overall gear reduction . . . steel-muscled power that "gets in, discharges and gets out" in a hurry!

transit-mix chassis for every job!

When you buy an INTERNATIONAL Truck you're buying from the world's most complete truck line.

What can this mean to you? For one thing, savings . . . a model *custom-tailored* to handle any size mixer unit you need in your operation at no premium cost!

And savings don't end there. Standardization on INTERNATIONAL Trucks assures a dependable pattern of performance, the availability of standard parts and fast, expert service — everything you need to keep your business moving at full efficiency.

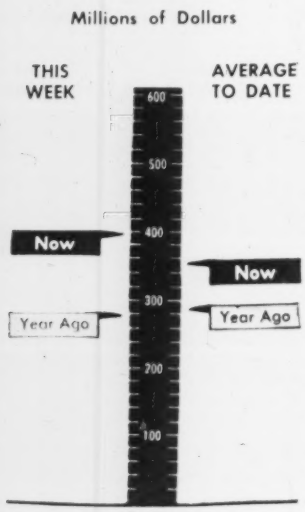
See your INTERNATIONAL Dealer for the facts and the figures. See if you don't agree . . . INTERNATIONAL is the truck that's "got it"!

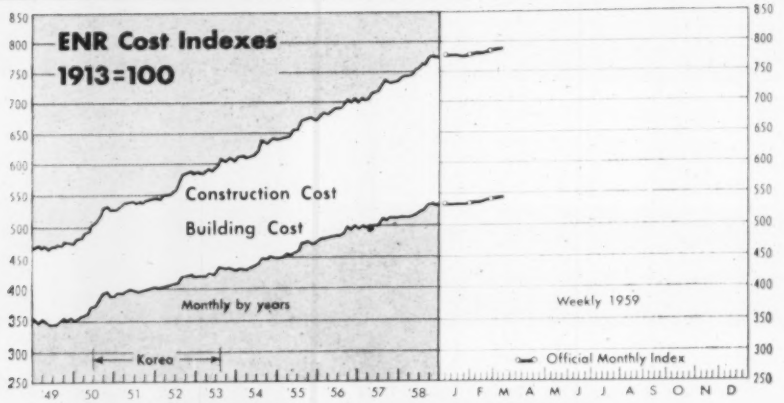
International Harvester Company, Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

INTERNATIONAL® TRUCKS cost least to own!

Construction Scoreboard

CONTRACTS ...





CURRENT COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of Mar. 12 1959	% Change from Feb. 12 1959	% Change from Feb. 1958
Construction Cost	783.07	+0.4	+5.0
Building Cost	542.04	+0.7	+4.8

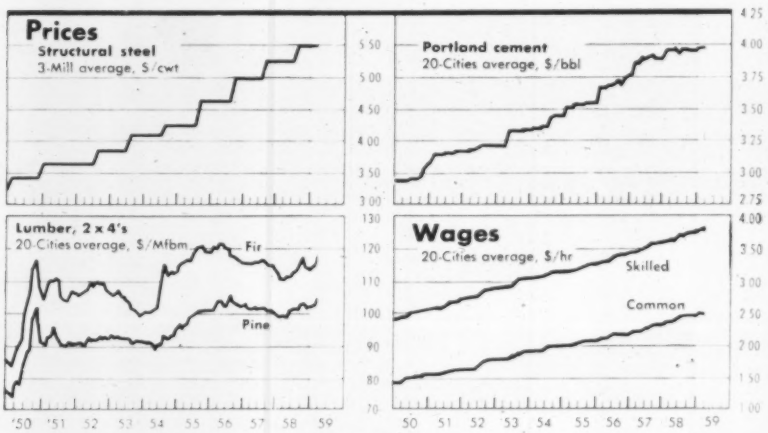
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 12 wks 1959	Chge '58-'59 %
	millions		
ALL Heavy Constr.	$393.7	$4,244.5	+25
PRIVATE	225.3	2,093.2	+35
PUBLIC	168.4	2,151.3	+17
State & Municipal	129.4	1,538.1	+5
Federal	39.0	613.2	+66
By Type of Work			
PUBLIC			
Waterworks	5.3	110.5	+138
Sewerage	10.9	129.6	+1
Bridges*	17.8	118.4	+62
Highways	34.1	585.3	+10
Earthwork, Waterways	15.3	159.5	+9
Buildings, Excl. Housing	49.6	564.8	+10
Housing	6.2	131.9	−48
Unclassified	29.3	321.3	+168
PRIVATE			
Buildings			
Mass Housing	100.5	359.6	+60
Commercial	17.7	479.1	+16
Industrial	102.4	655.4	+32
Unclassified	4.6	99.1	−19

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

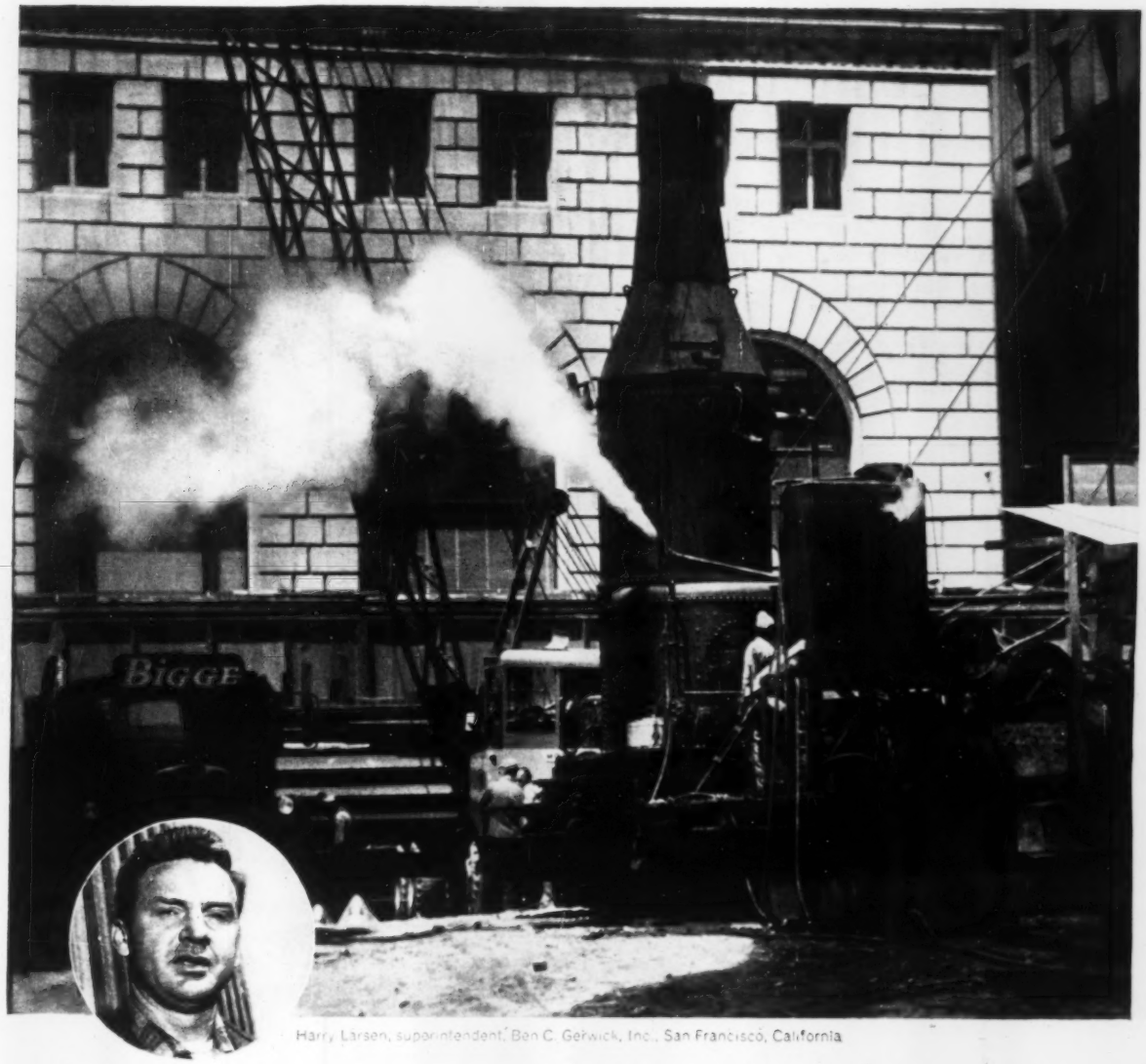


. . . CAPITAL

New Capital For Construction	Week of Mar. 12 millions	Cum. 11 wks 1959	Chge '58-'59 %
Corporate Securities	$ 96.5	$ 724.9	−41
State and Municipal:			
All Except Housing	146.7	1,347.7	−20
Housing	23.3	27.8	+2680
Federal Loans	3.7	21.0	−54
Federal Aid	...	...	...
Total Nonfederal	$270.1	$2,121.4	−28
Federal Appropriations:			
Projects in U. S.	...	...	−100
Outside U. S.	...	...	...
Total New Capital	$270.1	$2,121.4	−39

ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Mar. 1959	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Mar. 1959	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	594	0	+6.1	477	+0.6	+4.4
Baltimore	711	0	+5.5	543	0	+3.7
Birmingham	622	0	+4.7	495	0	+3.6
Boston	810	+0.6	+5.7	551	+2.0	+5.3
Chicago	866	+0.3	+3.6	569	+0.5	+7.3
Cincinnati	785	+1.0	+5.1	525	+1.9	+4.6
Cleveland	893	+0.4	+5.2	539	+0.7	+5.0
Dallas	573	0	+4.5	472	0	+4.4
Denver	731	0	+0.8	532	0	+1.7
Detroit	897	+0.6	+5.0	579	+0.9	+0.9
Kansas City	773	+0.7	+4.0	538	+0.9	+3.9
Los Angeles	828	+0.5	+6.6	536	+0.7	+5.4
Minneapolis	839	0	+4.3	554	0	+3.1
New Orleans	617	0	+4.7	494	0	+3.2
New York	968	+0.5	+6.0	629	+0.8	+5.7
Philadelphia	791	0	+2.0	570	0	+1.6
Pittsburgh	827	0	+2.8	595	0	+4.4
St. Louis	854	+0.9	+4.7	576	+1.4	+4.2
San Francisco	817	+0.4	+7.2	538	+0.6	+6.5
Seattle	830	0	+5.4	493	0	+5.5
U. S. 20 Cities' average	781	+0.2	+4.7	540	+0.6	+4.4
Montreal	603	0	+3.2	449	0	+0.7
Toronto	642	+0.2	+5.5	482	+0.4	+2.5



Harry Larsen, superintendent, Ben C. Gerwick, Inc., San Francisco, California

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Red Line Steaval Oils are compounded from the finest stocks to assure exceptional stability, correct atomization, good wetting action, maximum sealing and lubrication. Their ability to lubricate in the presence of moisture gives protection to sliding surfaces, miscellaneous gear boxes, babbit and bronze bearings common to equipment employed by almost every industry.

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OF CALIFORNIA

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Road Taxes: How They Skid Away

- **States needing money generally find the highway user a fast and steady source. But some of those funds don't buy roads.**
- **For every six miles of road built in the last 23 years, one mile's worth of road taxes has been diverted.**

It's roundup time in the states this year. They're scouting the range for additional revenues and highway users are among the chief targets.

But millions of highway-user tax dollars will be spent this year for all kinds of government activities that have nothing to do with roads.

• For every six miles of road built since 1935, a sum big enough to have built another mile of road has been lifted from highway-user taxes and used for other purposes.

• In 1956 and 1957, more than $630 million in highway-user fees and taxes were diverted to uses other than roads.

• More than $4.7 billion has been diverted since 1935—enough to have constructed about 148,000 miles of roads, says the American Petroleum Institute's Committee of Public Affairs. Some 860,000 miles have been built since 1935.

Florida leads the states in the percent of highway-user revenues spent for other than highways. More than $154.6 million was collected in 1957 from truckers and motorists. Of that total, 27.1% or $41.9 million, was diverted from highway administration, construction, debt-service and policing. It went into the state's general fund, county general funds and education.

Second place goes to Texas, with 18.1% of its $280.7 million in highway-user charges being diverted. The $50.7 million lifted from motor vehicle revenues pays for non-highway debt service and education.

• More from the pump—Because it can be quickly collected, the legislators turn to the motor fuel pump for additional income. Usually, higher levies on registrations and driver's permits follow.

Eight states are now considering measures that would boost the tax on gasoline and diesel fuel (see table). Passage of these measures is almost certain. The increases in the eight states will bring in total estimated additional revenue of from $53 million to $72 million.

New York put a boost into effect March 1. It is expected to bring in an additional $69.5 million. Seven other states have received proposals for increases but all have not come to the floor of the legislature. They are Arkansas, Delaware, Minnesota, Pennsylvania, Virginia, Ohio and Oklahoma.

In Florida, the legislature may enact a law that would permit the county government to levy another one cent to the existing seven cents tax per gallon on gasoline sold within its borders. This optional one-cent levy could be disbursed as required for any purpose.

• More, but not all—Roadbuilders can expect to receive some of the funds, but a large part of the increases will continue to go to other purposes.

There are 27 states with constitutional restrictions on diverting highway funds. But 10 of these did sift some funds to non-road purposes in 1957. This occurred because of specific direction in the constitutional amendment or other technicalities.

There were no diversions in the other 17 states, and another four states retained all their highway-user fees for highways only, even though no laws specifically required it.

One of those four states is Connecticut, but Gov. Abraham A. Ribicoff hopes to change the situation. His budget suggestions to the legislature call for diversion of all motor vehicle registration fees to the general fund. He would allow the $21 million from this source to be used for any purpose.

Four states are considering bills calling for adoption of anti-diversion amendments. They are Delaware, Maryland, Nebraska and New York. State legislatures in California, Massachusetts, North Dakota and Oregon have legislation pending that would repeal antidiversion amendments.

The federal Highway Trust Fund loses some of the user taxes collected. Of the $3.5 billion collected from federal gas and automotive excise taxes in the 12 months ending September 30, $1.4 billion was diverted (ENR Dec. 11, 1958, p. 21).

(BCF continued on page 252)

Eight States Plan 'Gas' Tax Increases

States Proposing Gas Tax Rise	Amount of Proposed Increase per Gallon	Current Tax	Estimated Gain in Revenue
Arizona	1¢	5¢	$ 4,150,000
Massachusetts ..	1	5½	12,100,000
Missouri	1 or 2	3	14,575,000 (on 1¢ rise) 29,150,000 (on 2¢ rise)
Montana	1	6	2,515,000
North Dakota ..	1	6	139,880
Oregon	1	6	5,732,000
Washington	1	6½	8,590,000
West Virginia ..	1 or 2	6	4,877,000 (on 1¢ rise) 9,754,000 (on 2¢ rise)

NEW AIR-COOLED DIESEL ENGINES

now available through

HERCULES

THE JLO* SERIES

(pronounced "ee-lo")

Distributed in the United States by Hercules Motors Corp.

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Check these outstanding features:

- **SIMPLICITY:** Jlo Series diesel engines are of 2-cycle design: eliminate valves, tappets, push-rods and camshaft for dependable, maintenance-free operation in their horsepower range.
- **LIGHTWEIGHT:** 2-cycle simplicity and judicious use of aluminum in construction reduce the weight of Jlo Series diesel engines to less than 15 pounds per horsepower!
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- **PERFORMANCE-PROVED:** Jlo Series air-cooled diesel engines have been used in every climate for every service in their power range. Fast-starting and rugged, they are ideal for both "stand-by" and continuous-duty operation.

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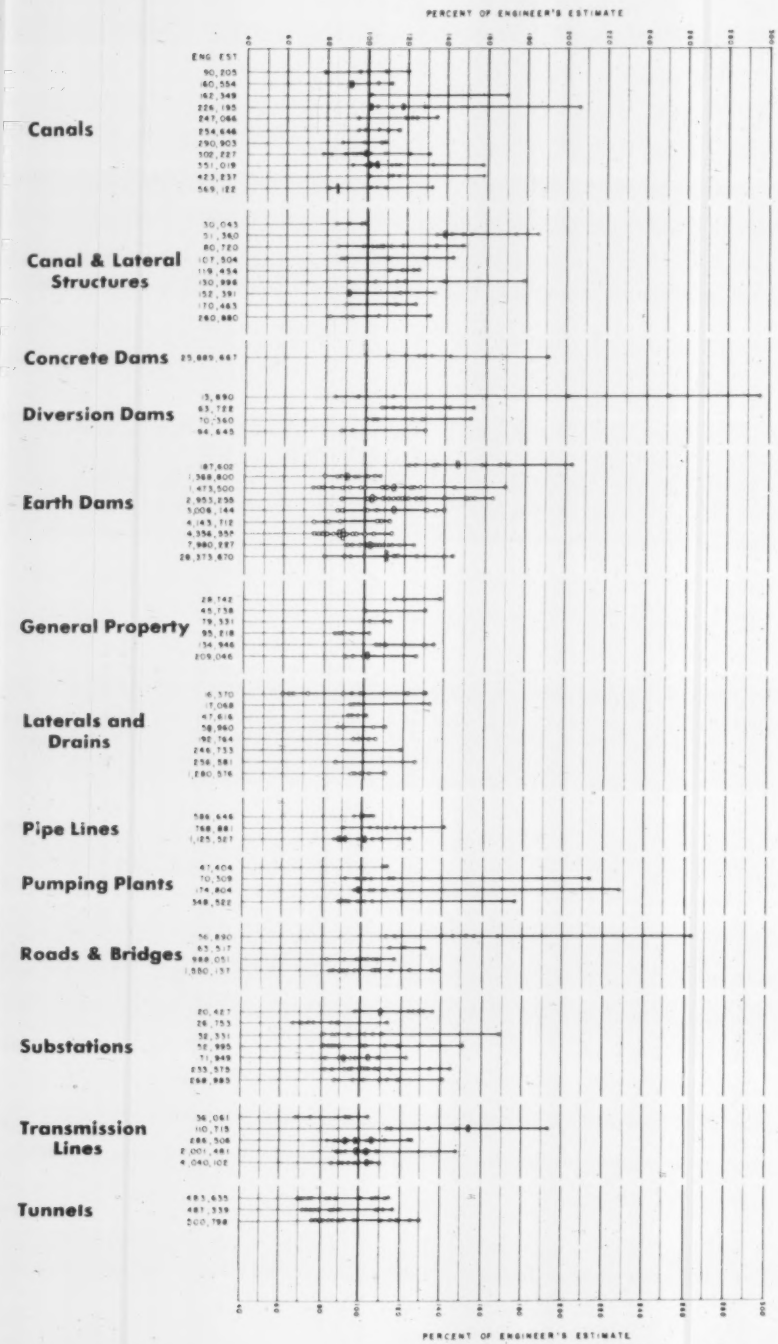
Competition Keen on Reclamation Jobs

How Bids Compare With Reclamation Estimates

(in dollars)



A highly competitive construction year put the squeeze on contractors bidding for Bureau of Reclamation projects in 1958. The chart at left shows the number of contractors bidding last year and the range of their bid prices in relation to engineers' estimates.

During 1958 the bureau called for bids on 109 separate schedules and at least one bid was received for each job. (This includes 33 "miscellaneous" schedules not shown on chart.) The low bids total about $97.2 million.

On the 109 schedules shown, the annual average of the three low bids, including alternates and rejected bids, was 97.9% of engineers' estimates. Excluding alternates and rejected bids, the annual average was 98.1% of engineers' estimates.

The annual average of the low bids, including alternate and rejected bids, was 91.7% of engineers' estimates. Excluding alternate and rejected bids, the average for the year was 91.8%.

There was an average of 6.9 bidders on the total of 109 projects for which bids were called.

Bidding interest was keen on the 23 construction jobs advertised during the fourth quarter. There was an average of 7.3 bids on each construction schedule. This is about 14% higher than the average of 6.4 bids received for all construction work advertised during the last five years.

Seventeen bids were below engineers' estimates and six were above.

Tennessee Design Fees Based on Allotted Funds

From now on Tennessee architects drawing plans for the state will be paid a percentage of the amount allotted for a job rather than a percentage of the actual cost.

Gov. Buford Ellington set the new state policy after rejecting a bid for construction of a new mental hospital in Memphis on the grounds that costs ran too far over the allotted funds.

He said the state will send the plans back to the architect for revamping.

The lowest general construction bid was $3,687,033 by G. E. Bass & Co. of Jackson, Miss. That figure was well in excess of the $3,250,000 earmarked for the entire project.

Architect for the job is A. L. Aydelott & Associates of Memphis.

Bids will be readvertised as soon as the plans are made to conform to the money available, Governor Ellington said.

(B&F continued on page 257)

FIVE MINUTES AT THE CONTROLS WILL CONVINCE YOU!

Blade tilts *hydraulically* on-the-go!

You just flip a couple of levers to drop either corner of blade up to 14" from center — for ditching and road-crowning. Same levers adjust blade pitch for best rolling action in various soils.

You can double your output with a CASE Tilt-Crown Dozer

FIVE MINUTES of operation will convince you that the *revolutionary* Case *hydraulic* Tilt-Crown dozer will *outwork* any conventional, straight-blade bulldozer in its power class — *at least 2 to 1!*

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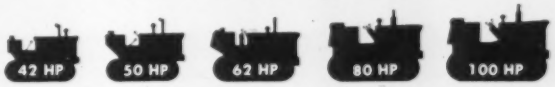

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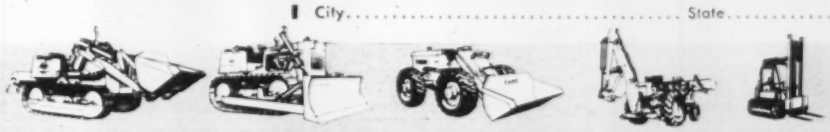

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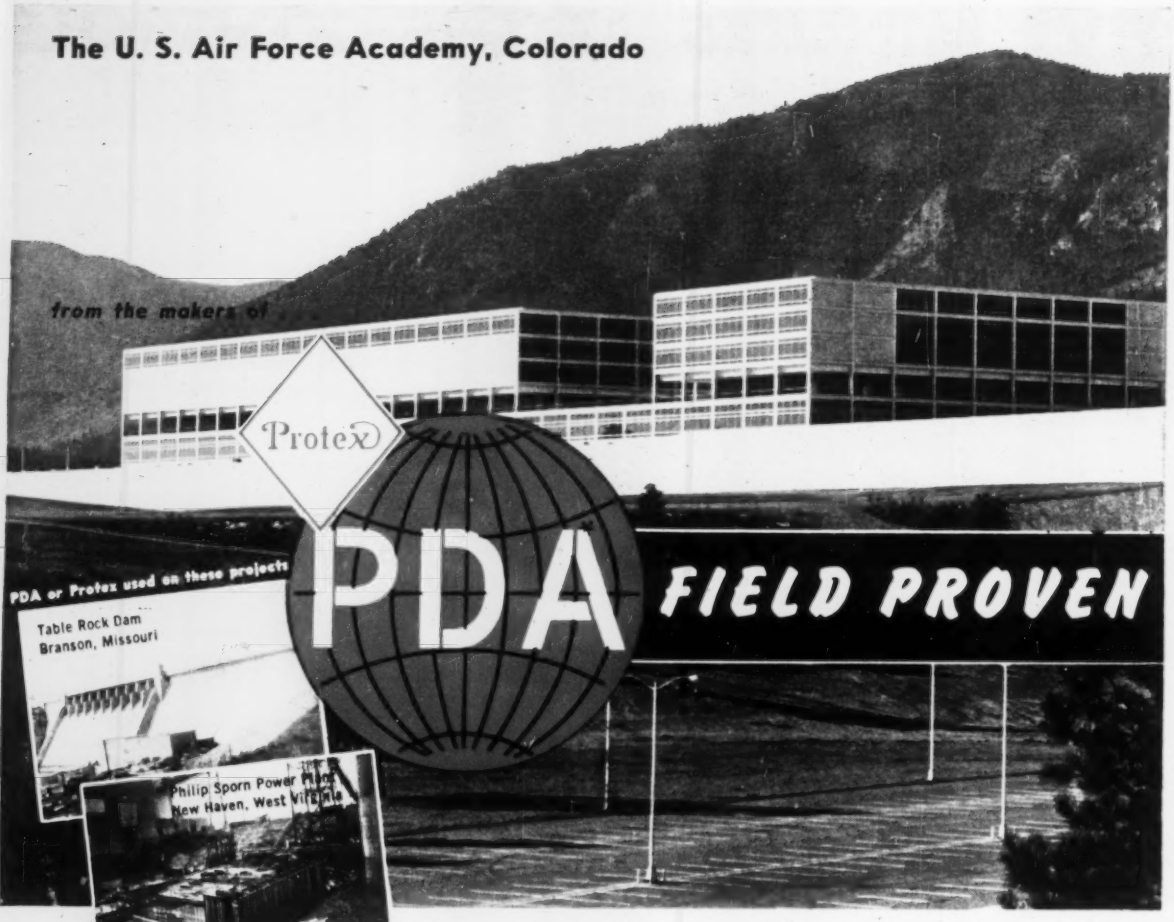

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Project: Barwise Junior High School, Wichita Falls, Texas. **Architects:** Jesse G. Dixon, Arch., R. B. Pardue, Asso., Wichita Falls, Texas. **General Contractor:** W. C. Shelton, Lawton, Okla. **Masonry Contractor:** W. P. Howle, Wichita Falls, Texas. **Dealer:** Stephens Lumber Co., Wichita Falls, Texas.

"We cut our teeth on a portland cement and lime mortar," says **W. P. Howle,** masonry contractor of Wichita Falls, Texas. "We were hard to convince that any other mortar could compare. Until some six years ago, that is. Then we tried Atlas Masonry Cement in mortar for a small commercial building. We've been using it ever since."

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Big Spender

Chemical industry plant outlays to top $1 billion

The chemical industry will break ground for $464.1 million worth of production facilities this year. Another $1.1 billion will be spent on projects now under way.

These outlays will bring total chemical plant construction outlays to an estimated $3.3 billion in the three-year period from 1958 through 1960, according to the Manufacturing Chemists' Association.

In 1958 the industry completed a record total of $1.8 billion.

The $1.6-billion total for new starts and facilities under way is well under the $2.5 billion anticipated for the same categories in last year's survey results. The decline resulted in part from construction cutbacks ordered during the recession months of mid-1958. However, by the end of 1958 the industry's construction program started to gain speed.

The cutbacks also reflect a general leveling-off of the chemical industry's requirements for new facilities. This is not considered alarming by the industry, however, because long-term goals established after World War II are being realized to a large extent.

For the last eight consecutive years, the chemical industry spent more than $1 billion annually on new plant and equipment. And the average annual investment for the past 13 years also tops $1 billion.

Texas will be first this year and next with outlays of $339 million; Louisiana, second with $226 million.

Industrial Building Gains Speed: Contracts Up 18%

Construction contract awards for industrial buildings are fulfilling earlier predictions (ENR Jan. 15, p. 21). Awards of $553 million during this year's first 11 weeks are 18% above last year.

And February's rise in new proposed plants virtually assures that more work will be going to contract in coming months.

Last month, more than $333 million worth of proposed industrial plants went to design boards, according to ENR records. That's more than double January volume and the second biggest month in more than a year. In the first two months of this year, plant proposals total more than $500 million, the volume one year ago.

Industrial Revival Continues

The upturn in industry's spending for new plants and equipment accelerated in the first three months of this year.

Plans for the April-June period point to another rise of 3% according to a joint estimate by the U. S. Department of Commerce and the Securities Exchange Commission. An April-June gain would be the third consecutive quarterly increase in plant and equipment investment.

Annual rate of spending in the second quarter of this year will be $32.03 billion. This is 8% above the low in July-September 1958.

First quarter outlays this year are now seen expanding twice as fast as the original estimates of 2% made last December (ENR Dec. 18, 1958, p. 82).

The more rapid climb during the first quarter and the continuing rise in the upcoming second quarter reflect the upturn in industrial building contracts.

Manufacturing companies and railroads will spark the rise in capital spending in the second quarter. Manufacturers will boost outlays by 6% and railroads by 33%.

Commercial business, however, is seen upping its outlay by only 0.4%. This small gain may indicate that smaller investment in equipment is offsetting the big gains in commercial construction, which are pointed up by ENR contract award figures. For the first two months they were up 38% to $383.9 million.

For the year, the report estimates U. S. business will spend a total of $31.79 billion. This compares with the recession year total of $30.52 billion and the prosperous year of 1957, when outlays tallied $36.96 billion.

The government estimate is slightly lower over-all than last fall's forecast for 1959 made by McGraw-Hill Publishing Co.'s Department of Economics, which estimated that $33.02 billion would be spent on new plant and equipment in 1959.

The government survey and the McGraw-Hill survey cannot be placed side-by-side. The sample of opinion is not identical and two slightly different investment concepts are involved. However, they both indicate a revival of expansion in industry. And the SEC-Commerce report confirms that industrial expansion will contribute materially to construction activity this year.

Plant and Equipment Spending Plans[1]

(SEC-Commerce estimates in billions of dollars)
Seasonally Adjusted at Annual Rates

	1958	1959		% Change	
	Q4	Q1[2]	Q2[2]	Q4 '58	Q1 '59
	Actual	Est.	Est.	Q1 '59	Q2 '59
Total—All Industry	29.97	31.16	32.03	+ 4	+ 3
Manufacturing	10.58	11.56	12.25	+ 9	+ 6
Durable-goods industries[3]	4.86	5.35	5.74	+10	+ 7
Iron and steel	.90	.98	1.16	+ 9	+18
Nonferrous metals	.34	.40	.39	+18	− 3
Electrical machinery & equipment	.44	.48	.51	+ 9	+ 6
Machinery except electrical	.79	.84	.95	+ 6	+13
Motor vehicles and equipment	.46	.57	.63	+24	+11
Transportation equipment excl. motor vehicles	.36	.36	.38	0	+ 6
Nondurable-goods industries[4]	5.72	6.21	6.51	+ 9	+ 5
Food and beverages	.75	.82	.82	+ 9	0
Textile-mill products	.30	.37	.41	+23	+11
Paper and allied products	.52	.59	.68	+14	+15
Chemicals and allied products	1.17	1.29	1.31	+10	+ 2
Petroleum and coal products	2.36	2.56	2.64	+ 8	+ 3
Mining	.97	.95	.90	− 2	− 5
Railroad	.58	.69	.92	+19	+33
Transportation other than rail	1.62	1.90	1.84	+17	− 3
Public utilities	6.26	6.08	6.10	− 3	+0.3
Commercial and other[5]	9.96	9.98	10.02	+0.2	+0.4

[1] Data exclude expenditures of agricultural business and outlays charged to current account.
[2] Estimates based on anticipated expenditures reported by business between December and early February.
[3] Includes fabricated metal products, lumber products, furniture and fixtures, instruments, ordnance, and miscellaneous manufactures.
[4] Includes apparel and related products, tobacco, leather and leather products, and printing and publishing.
[5] Includes trade, service, finance, and construction.

Costs: 'Double, Double Toil and

- **Unions and contractors are worried. They know wages will keep rising. But they don't agree on what costs can or should be cut.**
- **There's little evidence contractors will make a concerted effort to stabilize wages. It'll take a bigger squeeze to force that.**

People in the construction industry are doing a lot of talking about rising labor costs. But they are not prepared to do much about halting the upward trend this year—at least on the basic wage and fringe fronts.

The result is that 1959 collective bargaining sessions are sure to produce another round of substantial wage increases (see page 263). With it, however, will come greater emphasis on more and better work performance.

An ENR survey of contractor and union thinking shows the industry's ears are open to talk about inflation, over-pricing, unemployment and self-restraint.

Labor and management both say they are worried. But there is a marked absence of suggestions, plans or proposals to stabilize labor costs and there is no unanimity of thought on the problem.

There are two reasons for this. One is that the shoe has not pinched enough to require a change. The other is that those who are directly concerned—contractors and unions—are not sure what the real problem is.

• Contractors views differ. Some contractors think basic rates are the big problem and say this is the area in which their resistance will come.

Just as many disagree and point, instead, to fringe benefits. Here a few object not to the fringe benefits themselves but to the bookkeeping costs they entail.

Many contractors say they cannot quarrel with either of these cost factors. They regard the upward trend of both basic rates and fringe benefits as well established, necessary or inevitable. Some are reflecting a defeatist attitude. But one group of contractors is quite willing to continue granting reasonable demands in both areas.

A few contractors do not think of the labor cost challenge in terms of wages. Some Milwaukee contractors, for example, say the big problems are exorbitant public liability insurance premiums and the "stalling around" of bonding companies that push labor costs up. A Dallas contractor considers the cost of income tax withholding the "biggest and most unnecessary" labor cost.

One common view shows up in each of those groups: Many contractors feel the construction industry is pricing itself into the doldrums. Some contractors in Philadelphia feel one answer is to keep the profit margin small and to go after "volume." This, the small contractors say, is "already hurting us."

But despite these differences of opinion most employers agree with a San Francisco contractor who says: "I don't think wages or fringes are going to be cut. It's like trying to stop a river overflowing its banks."

An industry employer in Texas thinks contractors "will just continue to accept increased costs." Another says: "Some contractors will do anything if they can still make a buck."

This is what the AFL-CIO expects. The federation predicted last week that wage increases in 1959 will be "in general as large or larger than in 1958." Because of a "more favorable business background," it explains, "sizable wage increases should be the general rule."

• Labor is split. Not all union workers in the construction industry, however, concur with the AFL-CIO. The big split is between the top and lower echelons.

An international union representative feels "strongly" that "something must be done on the cost problem." He points to increasing evidence that many workers are pricing themselves—and their contractors—out of work.

The official gives these examples: Construction projects are being deferred in some cases. Jobs are being lost to industrial union workers and do-it-yourself work is increasing. Changes in design (such as dry walls and basement-less houses) and use of materials cheaper to install (such as curtain wall materials) are already hurting some trades. And nonunion men and United Construction Workers are getting a competitive advantage.

Business agents in New York, Maryland, Michigan and Missouri have expressed the same fears. One calls his position "untenable." "I know it's economically unsound to push our wages up much higher but what can I do? My members want more money."

This uneasiness among labor officials, however, has been translated into action in many areas. Unions in Baltimore and Philadelphia, for example, indicate they may go easy on 1959 demands. Some in Florida expect to let up on fringe benefits for fear they will push their contractors into the open shop. One roofers union plans to "trim our sails." Some intend to tailor their demands more closely to local conditions.

On the other hand, many remain in the ranks of the "unconvinced." They do not believe wages have risen faster than other costs. They feel that profit margins are still "large." And they do not believe that lower labor costs would increase construction volume.

"I don't know which comes first, the chicken or the egg," one unionist remarks. "But when it costs me more money to live, I need more money to cover it."

An Atlanta building tradesman pulls no punches: "What we're pushing heaviest for this year is a good wage increase."

• A common approach. Is there no answer? Most contractors and some unionists say there is an intermediate method. That is a widespread effort to cut what are commonly called hidden costs.

"Wasted time is more important than wages," says a Seattle contractor. And a Cleveland builder feels that "we could pay the men twice as much if they would produce twice as much more."

"All we ask is that they give us a little more in return," says another contractor.

What specific suggestions do contractors have? Here are some that have come in from all parts of the country:

Trouble'

• Knock off overtime and cut overtime rates. (Electricians in Bremerton have reduced their overtime rate from double-time to time-and-a-half and are now picking up much more work than before.)

• Reduce or eliminate travel time. ("We don't pay our office help for commuting so why should we pay our construction crews?")

• Insist on better supervision. (Both labor and management feel that contractors are primarily responsible for "doping off" on jobs. One carpenter says management "taught us some bad habits during the war when they were getting rich on cost-plus work.")

• Have men report directly to the job instead of to the shop first.

• Clamp down on starting and quitting times.

• Make the right work assignments. Avoid unnecessary disputes.

• Use machinery to its fullest advantage.

• Put coffee breaks on a regularized and sensible basis.

• Pay by check instead of cash if you can. (This system was negotiated in Cleveland last year. There is no time-off for check cashing. One contractor claims he has already saved $800 in burglary insurance.)

• Be adamant about featherbedding. (Contractors in the rural area around Philadelphia have been able to obtain contracts that do not call for a compressor operator to "assist hoisting engineers" or for an oiler to "work" with a crane operator.)

• Crusade against "petty" union jurisdictional jealousy. (Says a Phoenix contractor: "There's no reason why a carpenter can't run two feet of wiring, or fasten a plumbing fitting. They're capable of it. We don't intend to transform a carpenter into another type of craftsman.)

• Insist that the foreman work. Push a demand to cut down on the number of foremen. Get a more sensible arrangement on size of work crews.

• Keep your labor contracts as simple, clear and short as possible.

• Work with other contractor groups in your area on common problems.

• Exercise your legal rights in hiring and firing.

• A day of reckoning?—The long-range approach to a solution of the labor cost problem, however, is not so simple or direct.

What contractors are saying . . .

"We are very concerned. Labor costs are reaching the saturation point. Something's got to be done."

"Everything is fine as long as the economy continues to spiral along with inflation. But eventually we will price ourselves out of business."

"There is no possibility of stopping the upward trend. The wage rate is the basic high figure and that can't be helped. Also, it's hard to argue about fringe benefits."

"Higher labor costs are due not only to labor but to some managements looking for a chance to raise prices. We haven't done too good a job of supervision either."

"Unnecessary labor costs lie mostly in high public liability charges by insurance companies. Withholding of taxes is another unnecessary expense."

"We've got to start cutting down on things like wasted time, travel pay and show-up time."

"Wage increases would never be a disputed point in negotiations if management received greater productivity or a better labor situation."

What union workers are saying . . .

"We must stabilize wages. Inflation victims include building tradesmen. We have a lot to lose."

"We are very much concerned. What good would it do us to have a wage scale of $5 an hour if there were no jobs?"

"Our members want so much you're ashamed to go in and ask for it."

"If they would keep down the price of our groceries, we wouldn't have to go in everytime and ask for higher wages."

"Contractors are raising prices a lot faster than wages are going up. The larger margin of profits is what's pushing costs up. They complain about high union wages but not about the wad they make."

"Supervision is the key. If a man isn't doing the work, or isn't needed on the job, that's the responsibility of the foreman."

"We want to cooperate. But we want a plan that's good for all of us."

Part of the problem is that the peas in the construction pod are not alike. The situations differ by trades and localities. And existing wage differentials alone would afford endless possibilities for "adjustments."

A member of the Associated General Contractors on the West Coast feels that the "problem is too big to be solved on the local level. "We're waiting for a Moses to lead us out of the wilderness."

And "Moses" would have to be "mandatory controls," an eastern contractor sadly observes. "What else can ever make the construction industry face up to the problem?" he asks.

None of the other construction industry members surveyed by ENR, however, voiced any concern or apprehension about controls. They seem to feel that that kind of regulation is a remote possibility at best.

(Labor continued on p. 263)

Another P&H team speeding up a large sewer project for the La Fera Contracting Company, Newark, New Jersey. A P&H 955A hoe and a P&H 955A-LC clamshell are trenching, laying pipe, and backfilling at Cataret, New Jersey, near the New Jersey Turnpike.

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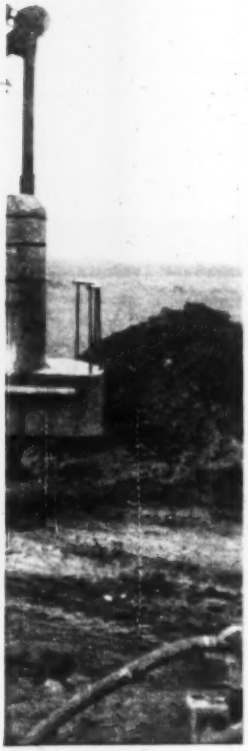

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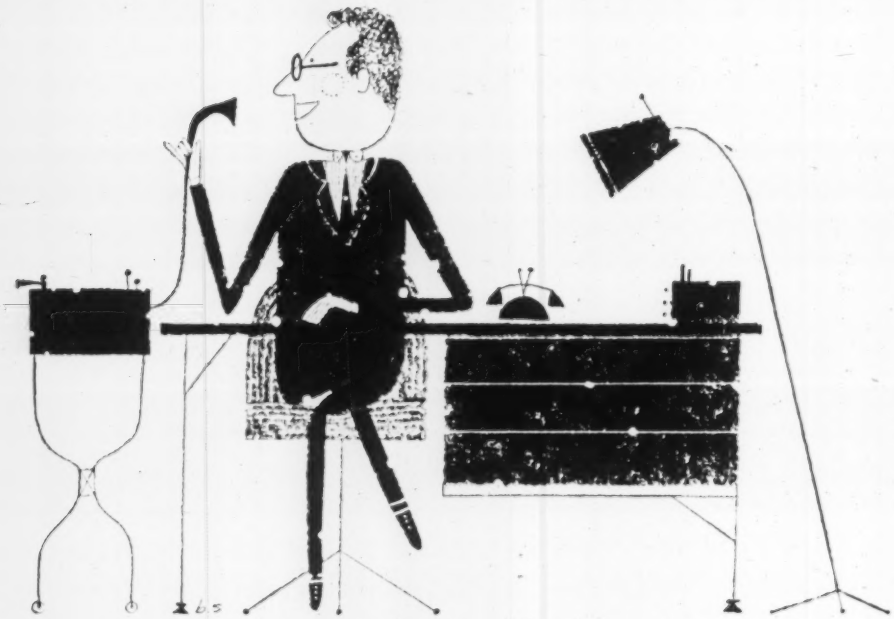

In a recent 30-day period, *Construction Daily* listed contracts awarded by 167 companies in business and industry. Total value: $252,500,000. At last count, Business Week had *over 7,800 management subscribers in companies accounting for 90% of that $252,500,000.* When you seek a contract in business and industry, you seek it from the management man, the Business Week reader. *Advertise in Business Week.* BW reaches across all business and industry, offering you more management readership per advertising dollar than any other magazine in its field.

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Wage Boosts Don't Slow Down

Union building tradesmen in five areas have won 1959 basic wage increases that average 20 cents an hour. Their deferred increases for 1960 average 13 cents.

In negotiations still under way, union demands are ranging from 40 cents to $1.00.

One of the biggest increases—25 cents an hour—came in a one-year contract covering 250 members of the Associated General Contractors' Spokane chapter and 4,000 operating engineers in eastern Washington and northern Idaho. Travel pay provisions and health and welfare contributions of 7½ cents an hour are carried over from last year.

In Oregon, most of the painters locals have signed three-year contracts for 15½ cents this year, 17 cents next year and 18 cents in 1961. A 10-cent health and welfare contribution is continued.

Two Illinois trades have also matched or bettered the 15-cent mark. Carpenters in Jacksonville get 15 cents this year and 10 cents in each of the next two years under a three-year contract. Plumbers in Champaign settled for a two-year contract with 20 cents this year and 10 cents in 1960; their new scale is $3.70.

In contrast, some 1,800 plumbers and steamfitters in Portland, Ore., have done much better. They will receive four raises under a two-year contract—15 cents now, 10 cents in September, 10 cents next March and another 10 cents in September 1960. Their new scale is $3.88. Employer contributions of 14 cents for vacations and 10 cents for health and welfare are continued. Before the contract ends, the subject of pensions will come up for discussion.

On the demand side, one union in Jacksonville, Fla., has presented the Associated General Contractors with a 40-cent demand. Bricklayers in Essex County, N. J., are asking for 35 cents each year for three years—they are now getting $4.47 in wages and fringe benefits.

In Arizona, the carpenters started negotiations with a $1.00 demand. Contractors have countered with—and are offering five basic crafts—a 65½-cent hourly wage increase and additional welfare benefits in a three-year contract. The proposal calls for an immediate increase of 10 cents, eight cents in basic wages and 7½ cents in health and welfare next June, 20 cents in 1960 and 20 cents in 1961.

Featherbedding Ban Is Sought

Building contractors in New Jersey are asking Congress to outlaw featherbedding practices in the construction industry.

A direct appeal to a number of Senators and Congressmen has been made by Paul J. Brienza, managing director of the Building Contractors Association of New Jersey.

Mr. Brienza points out that none of the pending labor bills attempts to cope with the featherbedding problem, which is now unnecessarily adding to the costs of all construction.

He described featherbedding as the "creation of unnecessary jobs" or a demand "for payment for work which is not performed."

Featherbedding situations still exist in some New Jersey areas, Mr. Brienza asserts. As examples, he cites an electrical union demand that a man be placed on a welding machine used by another craft or be hired "for temporary light after installation"; a steamfitter demand for around-the-clock coverage of an automatic temporary heating system; an ironworker demand for a signalman on cranes when no iron is being hoisted; and an operating engineers' demand that a man be placed on small compressors.

The Taft-Hartley Act does not mention "featherbedding," but makes it an unfair labor practice for a union to ask for money "in the nature of an exaction for services which are not performed, or not to be performed." It is almost impossible, because of the escape clause, to sustain a charge of featherbedding under this section.

Construction Employment Down 100,000 in Month

Employment in the construction industry erased its January gain and tumbled to 2,242,000 in February. This was a drop of 100,000. The U. S. Labor Department called the decline "relatively sharp."

The employment figure was 69,000 higher than it was a year ago. But it still marked the second lowest monthly level since the recession began.

At the same time, the number of idle workers in all industries rose by 25,000 to 4,849,000. Except for 1958, this is the highest February totals since the war.

OFFICIAL PROPOSALS

Bids: May 14, 1959

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

The Royal Irrigation Department of the Kingdom of Thailand requests sealed written bids for furnishing and delivering cif Bangkok Wharf for the Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, including Invitation for Bids—No. YS-2-5, the following equipment:

Four (4) 1.25 meter X 1.80 meter high-pressure gates and two (2) conduit linings, including controls and accessories.

Bids will be opened at 10:00 a.m., 14 May 1959. Copies of Contract Documents, including Invitation for Bids—No. YS-2-5, may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to Royal Irrigation Department, Attention: Thai Liaison Engineer, c/o Engineering Consultants, Inc., 1940 West Mississippi Avenue, Denver 23, Colorado, U.S.A. Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $10.00 for each copy of the contract documents requested.

M. L. Nujati Kambhu
Director General
Royal Irrigation Department

Bids: April 14, 1959

The Baltimore and Ohio
Chicago Terminal
Railroad Company

Will receive bids on April 14, 1959, at 11:00 A.M. E.S.T., for the construction of two double track railroad bridges, complete, across Calumet-Sag Channel at Blue Island, Illinois, designated Nos. 1548-D and 1865-C. Bridge No. 1548-D is 250 feet through truss, fixed span with 25 ft. beam approaches. Bridge No. 1865-C is 250 feet through truss fixed span with 25 ft. beam approaches.

Plans, specifications, bidding and contract forms may be seen at the office of Mr. C. E. Zeman, Regional Engineer, 361 Grand Central Station, Harrison and Wells Streets, Chicago 7, Illinois, and at the office of Mr. C. R. Riley, Chief Engineer, 1302 Baltimore and Ohio Building, Baltimore and Charles Streets, Baltimore 1, Md.

Copies of these papers may be secured at the said offices by bona fide bidders by the deposit of $35.00 for each set, which will be refunded upon returning the set in good condition within one week after the award of contract.

Bids: May 28, 1959

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

The Royal Irrigation Department of the Kingdom of Thailand requests sealed written bids for furnishing and delivering cif Bangkok Wharf for the Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, including Invitation for Bids—No. YS-1-2, the following equipment:

Mechanical refrigeration equipment consisting of water chilling units having a combined capacity of 600 tons refrigeration, chip ice-making units having a combined capacity of 200 short tons of ice per day, cooling tower, chip ice conveyor, complete with accessories, spare parts and tools.

Bids will be opened at 10:00 a.m., 28 May 1959. Copies of Contract Documents, including Invitation for Bids—No. YS-1-2, may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to Royal Irrigation Department, Attention: Thai Liaison Engineer, c/o Engineering Consultants, Inc., 1940 West Mississippi Avenue, Denver 23, Colorado, U.S.A. Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $10.00 for each copy of the contract documents requested.

M. L. Nujati Kambhu
Director General
Royal Irrigation Department

READ THE OFFICIAL
PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Bids: April 2, 1959

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Public Buildings Law, and specific provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 2nd day of April 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie	FASCE 59-1	Scajaquada Creek Expressway Sect. I (Niagara Thruway to Grant St. Interchange) Proj. U-1087(1)	1.90 (0.91 Acc.)	Viaduct Structure = 1.26 Miles 9" Cem. Conc. Pavt. Var. Wide = 0.41 Miles Asph. Conc. Pavt. = 0.26 Miles Misc. Work = 0.88 Mile	$357,000 Plans $10	$6,502,000
Erie Int. Tour Rte. 90N	FINTC 59-1 NTC 59-2	Interstate Route 500 New York State Thruway Niagara Section, Sub. N2 to N7 (Buffalo East City Line to South Grand Island Bridge) Proj. I-865(19)	14.50	Furnish & Install Electric Lighting Supply Points Equip.	$9,000 Plans $5	162,000
DISTRICT No. 6, James H. Thomas, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany	FASS 59-7	Belvidere-Angelica Co. Rd. No. 20 Proj. S-529(1)	0.48	Bit. Mac. with Double Surf. Treat. Pavt. Comp. Beam Br. 3 Span 275'	$20,000 Plans $5	361,000
Schuyler (Rte. 14)	FARC 59-22	Watkins Montour Falls, S.H. 5047 Proj. F-505(10)	1.33	Asphalt Concrete Pavement	$19,000 Plans $5	186,000
Steuben (Rte. 21)	FARC 59-21	Hornell-Wayland, Part 5, S.H. 8257 Proj. F-575(8)	2.63	Asph. Conc. Pavt. = 2.62 Miles Misc. Work = 0.01 Miles	$16,000 Plans $5	293,000
Steuben	FASS 59-9	Morgan Bridge, Co. Rd. No. 11 Proj. S-949(2)	0.81	Bit. Mac. with Double Surf. Treat. Pavt. Prestress Conc. Br. 4 Span 244'	$20,000 Plans $5	377,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 141 Van Duzee Street, Watertown, New York						
Franklin & St. Lawrence (Rte. 37)	RC 59-23	Massena-Helena, Pt. 1 & Pt. 2, S.H. 1261 and S.H. 1263 Raquette River-Hogansburg, Pt. 1 and Pt. 2, S.H. 1861 and S.H. 8096	4.58	Asphalt Concrete Pavement	$9,000 Plans $5	150,000
DISTRICT No. 9, Joseph C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Otsego	FASS 59-8	Unadilla-Copes Corners, Co. Rd. No. 3 Proj. S-481(1)	0.30	Bit. Mac. with Double Surf. Treat. Pavt. Deck Girder Br. 1 Span 124'	$11,000 Plans $5	211,000
DISTRICT No. 10, M. E. Gott, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Queens Int. Tour Rte. 195)	FICE 59-2	Interstate Route Conn. 513 Clearview Expressway (33th Ave. to Willets Point Blvd.) Cont. No. 3 Proj. I-1112(11)	1.82 (2.82 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wide = 1.57 Miles (Access = 1.63 Miles Asph. Conc. and 1.19 Cem. Conc.) 3 Hy. Segs. W. F. Comp. Beam 2 Spans Each 114.3', 126.3' and 121' 1 Ped. Overpass W. F. Beam 4 Span 212.5' Misc. Work = 0.25 Miles	$420,000 Plans $10	7,678,000
Suffolk	HSP 59-1	Heckscher State Parkway (Sunrise Highway to Heckscher State Park) Cont. 1	6.27 (4.43 Acc.)	8" Cem. Conc. Pavt. with Carbon Black 2 @ 25' Var. Wide = 3.25 Miles 8" Cem. Conc. Pavt. Var. Wide = 2.64 Miles Asph. Conc. Pavt. = 4.73 Miles Misc. Work = 0.08 Mi. 4 Hy. Segs. Reinf. Conc. Rig. Frames 65.2', 66.5', 103.8' and 123.8' 1 Hy. Sep. Comp. Girder, 4 Span 215.2' RR Sep. Comp. Girder, 2 Span 167.8	$458,000 Plans $10	8,327,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: April 17, 1959

Notice to Contractors

Sealed bids for furnishing labor, materials and equipment for rehabilitating and enlarging the present filter plant, new coagulating and settling basins, new wash water and clear water standpipe with foundation, together with furnishing and installing miscellaneous material and equipment for the Water Commissioners' of the Town of Waterford, New York will be received at the office of the Water Commissioners, Second Street Pumping Station, Waterford, New York, until 8:00 o'clock P.M., Eastern Standard Time, on the 17th day of April, 1959, and then at said office, publicly opened and read aloud.

The work to be done has been divided into ten sections; bidders may submit proposals on any or all sections. Particular attention of the bidders for Sections B and G is drawn to the alternate for the raw water pump station structure.

Section A—Demolition Work.
Section B—General outside construction.
Section C—Outside piping.
Section D—General rehabilitation of existing filter plant.
Section E—Furnishing and erecting wash water and clear water standpipe.
Section F—Electrical work.
Section G—Inside piping at the filter plant.
Section H—Plumbing work.
Section J—Heating work.
Section K—Furnishing raw water, low lift and high lift pumps.

The Information for Bidders, Form of Contract, Plans and Specifications and Form of Performance Bond may be examined at the offices of the Water Commissioners at the Water Works Pumping Station on Second Street, Waterford, New York and at the office of Keis and Holroyd, Consulting Engineers, 257 Broadway, Troy, New York. Copies thereof may be obtained at the said offices of the Water Commissioners or Keis & Holroyd, upon payment of $25.00 for each set. Any bidder upon returning such set promptly in good condition, will be refunded his payment and any non-bidder upon so returning such set within 30 days of date for receiving bids, will be refunded $20.00.

The Water Commissioners, Waterford, New York, reserve the right to waive any informalities in or to reject any or all bids.

A certified check made payable to the order of the Water Commissioners of the Town of Waterford, New York, or bid bond in amount of 5% of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within 5 days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so, he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Water Commissioners of the Town of Waterford, New York, in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Water Commissioners of the Town of Waterford, New York.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above schedule time for the opening of bids or authorized postponement thereof.

W. LEE BLOOD,
President

Dated: March 11, 1959
KEIS & HOLROYD
CONSULTING ENGINEERS
TROY, NEW YORK

OFFICIAL PROPOSAL

RATE: $2.40 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, P. O. Box 12, New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: April 30, 1959.

Oroville-Wyandotte Irrigation District South Fork Project—Part I Invitation for Bids

1-0 NOTICE OF INVITATION

1-1 Notice is hereby given that the Board of Directors of Oroville-Wyandotte Irrigation District will receive sealed bids at the office of said District, near Oroville, Butte County, California, until the closing time of 2:00 PM, Pacific Daylight Saving Time, April 30, 1959, for the construction of the "South Fork Project". At that time such bids will be publicly opened and read. The Contract or Contracts for the work will be awarded to the lowest responsible bidder or bidders, but any or all bids may be rejected. The Project comprises the following major features, complete with all auxiliaries and appurtenances, located generally in the drainage basin of the South Fork of the Feather River and adjoining territory, east of Oroville, in the Counties of Plumas, Sierra, Butte and Yuba, State of California.

SCHEDULE NO. DESCRIPTION

1—Furnish Concrete Aggregates

2—Little Grass Valley Dam and Reservoir

3—Six Creek Dam and Reservoir

4—Slate Creek Storage Dam and Reservoir, and Ponderosa Dam and Reservoir

5—South Fork Diversion Dam and Tunnel, and Slate Creek Diversion Dam and Tunnel

6—Woodleaf Tunnel, and Lost Creek Dam Repairs

7—Forbestown Diversion Dam and Tunnel

8—Woodleaf Penstock, Surge Tank and Powerhouse; Forbestown Penstock, Surge Tank and Powerhouse; Kelly Ridge Penstock and Powerhouse; Miscellaneous Buildings; Service Power and Communication Lines

9—Miner's Ranch Canal and Tunnel; Miner's Ranch Dam and Reservoir; Kelly Ridge Canal and Tunnel; Bangor Irrigation Canal; and Mt. Ida Irrigation Canal

1-2 Bids shall conform with the requirements of this Invitation for Bids and other documents listed herein, and any amendments or addenda thereto issued in advance of bid opening date.

2-0 DOCUMENTS INCLUDED

The documents setting forth the bid requirements and the work to be performed comprise the following:

Part I
Invitation for Bids

Part II
Instructions to Bidders

Part III
Bid Forms and Schedules

Part IV
Contract Forms

Part V
General and Special Conditions

Parts VI through XVIII
Technical Specifications

Part XIX
Drawings, at reduced size

Part XX
Procurement specifications for major items of equipment

3-0 OBTAINING DOCUMENTS

3-1 The documents are available for examination without charge at the offices of the Oroville-Wyandotte Irrigation District near Oroville, California, and at the Offices of Bechtel Corporation, Engineer for the District, at Room No. 407, 161 California Street, San Francisco, California, during normal business hours.

3-2 Single copies of the documents may be obtained, by bona fide construction contractors intending to bid, on a loan basis from the offices of Bechtel Corporation at the above address by making a deposit equal to the amount of the charge hereinafter stipulated. Deposits will be refunded if and when the documents are returned in good condition, transportation prepaid, and bearing a postmark or shipping receipt date not later than thirty (30) days after the bid opening date. Extra copies will be furnished such bidders, and others interested, on a non-refundable charge basis. Deposits or non-refundable charges shall be in the form of postal money orders or certified checks made payable to Bechtel Corporation and delivered at the time and place the documents are obtained. The amounts of the charges per set of documents are as follows:

ITEM	CHARGE
a. Invitation for Bids, Instructions to Bidders, Bid and Contract Forms	None
b. SCHEDULE 1: Specifications and reduced size drawings	3.00
c. SCHEDULE 2: Specifications and reduced size drawings	10.00
d. SCHEDULE 3: Specifications and reduced size drawings	10.00
e. SCHEDULE 4: Specifications and reduced size drawings	10.00
f. SCHEDULE 5: Specifications and reduced size drawings	12.00
g. SCHEDULE 6: Specifications and reduced size drawings	12.00
h. SCHEDULE 7: Specifications and reduced size drawings	12.00
i. SCHEDULE 8: Specifications and reduced size drawings	30.00
j. SCHEDULE 9: Specifications and reduced size drawings	15.00
k. Complete set of all specifications and drawings (reduced size) listed above	50.00

3-3 Bidders desiring full size prints of the contract drawings may obtain them at the rate of forty-five (45) cents per print. Requests should be addressed to Bechtel Corporation, 161 California Street, San Francisco, enclosing proper remittance. These prints will be shipped transportation charges collect via railway express unless air express is requested.

5-0 DOMESTIC MATERIALS

Price, fitness and quality being equal, supplies grown, manufactured, or produced in the State of California will be preferred in the performance of the work under the Contract, and next preference will be given to supplies partially manufactured, grown, or produced in the State of California.

Dated this eleventh day of March, 1959.
Board of Directors
Oroville-Wyandotte Irrigation District
By D. D. Updegraff
(Title) President

Bids: April 16, 1959

Gates—Chili-Ogden Sewer District

Sealed bids for Section "D" for the Construction of Trunk and Street Lateral Sewers for the Gates-Chili-Ogden Sewer District, will be received by the Monroe County Sewer Agency at its office at 406 Terminal Building, 65 Broad Street, Rochester 14, New York, until 11 o'clock A.M., E.S.T., on the 16th day of April 1959.

Bidding forms can be obtained and plans and specifications examined at the office of the Sewer Agency, or the office of The Losier Company, Engineers, 10 Gibbs Street, Rochester 4, New York.

Copies of plans and specifications may be obtained upon the payment of Twenty-Five Dollars ($25.00) for each set. The full amount charged will be returned to all bidders who return the complete plans and specifications in an acceptable condition within thirty days (30) days from the date of award to the successful contractor. Half of the amount charged will be returned to non-bidders who return the complete plans and specifications in an acceptable condition within thirty (30) days from the date of award to the successful contractor. Checks or money orders should be made payable to the order of Clarence A. Smith, Monroe County Director of Finance.

The work consists of the construction of:
SECTION "D"—Approximately 25 miles of sanitary sewers 8 inch to 24 inch, in diameter with all appurtenances.

COUNTY OF MONROE
By: C. A. Bennett,
Purchasing Agent

March 16, 1959

Bids: April 13, 1959

San Juan Metropolitan Sanitary Sewer System

Notice is hereby given that sealed bids for Section A of the San Juan Metropolitan Sanitary Sewer System, Bayamon Trunk Sewer, Part II, for Furnishing Concrete Sewer Pipe and Appurtenances will be received in accordance with the law by the Puerto Rico Aqueduct and Sewer Authority until three o'clock P.M., Atlantic Time, on the thirteenth day of April, 1959, at the office of the Authority in Santurce, Puerto Rico, and will then be publicly opened and read.

The work to be done comprises furnishing all materials and labor, tools, plant and equipment necessary for fabricating and delivering approximately 13,050 lineal feet of 66 inch and 72 inch reinforced concrete sewer pipe together with rubber gaskets and rubber cement for making joints, all in accordance with specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York, and #223 Manuel V. Domenech Street, Hato Rey Puerto Rico, mailing address, Post Office Box 8861, Fernandez Juncos Station, Santurce, Puerto Rico.

Copies of the specifications may be examined without charge at the office of the Treasurer of the Puerto Rico Aqueduct and Sewer Authority, at the Pentagon Building, Ponce de Leon Avenue, Stop 26½, Santurce, Puerto Rico, or at the offices of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at the office of the Treasurer of the Puerto Rico Aqueduct and Sewer Authority, Stop 26½, Fernandez Juncos Avenue, Santurce, Puerto Rico or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York, upon deposit of cash or certified check payable to the Puerto Rico Aqueduct and Sewer Authority in the amount of Twenty ($20.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within thirty (30) days after the date on which bids are received or else the entire deposit will be forfeited.

Special attention is called to the bidders that blank forms may be obtained only up to forty-eight (48) hours before the date for opening of bids and that any bid that does not contain the prices written in letters and figures will be rejected.

The Authority will receive bids only from persons or firms that have requested specifications and made the required deposit therefor under their own names.

Each proposal must be accompanied by a certified check or bid bond from a reliable surety company authorized to do business in Puerto Rico and satisfactory to the Authority, in amount equal to five (5%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The project will be financed in part by a grant-in-aid from the United States Government under the provision of Public Law 660, Water Pollution Control Act Amendments of 1956.

The Authority reserves the right to consider bids for sixty (60) days after their receipt before awarding any contract and the right is reserved to waive any informalities, and to reject any or all bids. The award will be made to the responsible bidder submitting the lowest acceptable bid, and the responsibility of the bidders will be determined by the Authority.

PUERTO RICO AQUEDUCT AND SEWER AUTHORITY
By: RAFAEL V. URRUTIA
Executive Director

BUCK, SEIFERT AND JOST
Consulting Engineers

Bids: March 27, 1959.

Govt. of District of Columbia, Dept. of Hwys. & Traffic, D. C.

February 27, 1959.

SEALED PROPOSALS will be received in Room 404, 499 Pa. Ave., N.W., Wash. 1, D.C., until 2 PM, EST, March 27, 1959, and then publicly opened and read for construction of Channel Piers for Washington Channel Bridge, District of Columbia Bridge No. 1113, Federal-Aid Interstate Project No. I-95-1(18)1, consisting of 6,833 cu. yds. Structure Excavation; 12,908 cu. yds. Concrete; 71,737 lin. ft. Steel H Beam piles in place; and 38,519 cu. ft. Class B Stone Masonry Facing. "Minimum wage rates for this project have been predetermined as required by law". Proposal forms, plans and specifications obtainable from Supervisor, Bid & Contract Section, Procurement Office, D.C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D.C. Treasurer (phone NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: May 5, 1959

Notice to Contractors

Sealed Proposals for the construction of Industrial Waterworks Improvements will be received by The Industrial Water Board of the City of Birmingham, Alabama, in the Commission Chamber, at the City Hall until 2:00 P.M. o'clock, C.S.T., on Tuesday, May 5, 1959, at which time and place they will be publicly opened and read.

Plans, Specifications and Contract Documents are open to public inspection at the offices of said Board, 105 City Hall Building, Birmingham, Alabama and at the offices of J. W. Goodwin Engineering Company, 2111 Seventh Avenue, South, Birmingham, Alabama, or may be obtained from J. W. Goodwin Engineering Company, upon deposit of $75.00. The full amount of deposit for one set of documents will be refunded (with deductions not exceeding the actual cost of the documents) upon return of all documents in good condition within three (3) days after the date of opening bids.

The Work proposed to be constructed consists of the following approximate quantities:

CONTRACT NO. ONE

BASE BID PROPOSAL

38,825 L.F. 60" Steel Pipe Transmission Main, ¼" Wall; 4,289 L.F. 60" Steel Pipe Transmission Main, 9/16" Wall; 9,589 L.F. 60" Steel Pipe Transmission Main, ⅜" Wall; 10,700 L.F. 60" Steel Pipe Transmission Main, 11/16" Wall; 75,000 lb. Steel Fabricated Bends; 60 Each Miter Cuts; 20 Each 6" Steel Pipe Blowoff Assemblies; 7 Each 12" Steel Pipe Blowoff Assemblies; 250 L.F. 6" Steel Pipe for Adjustment at Blowoff Assemblies; 100 L.F. 12" Steel Pipe for Adjustment at Blowoff Assemblies; 37 Each Standard Air and Vacuum Valve Assemblies, Type 1; 17 Each Standard Air and Vacuum Valve Assemblies, Type 2; 60 Each Manholes on Steel Pipe; 15 Each Cathodic Test Lead Stations on Steel Pipe; 1 Each 36" Line Valve Assemblies; 1 L.S. Surge Control Installation at Station 126 + 00; 1 L.S. Special Check Valve and Air Valve Installation at Station 125 + 00; 1 L.S. River Crossing at Station 422 + 00; 44,000 Each Sack Breakers; 288 Each Joint Harness Sets for 60" Pipe; 1,000 C.Y. Unformed or Rough Formed Class "B" Concrete for Anchors, Thrust Blocks, etc.; 5,000 S.Y. Rip-Rap; 64 S.Y. Remove and Replace Pavement; 25,000 C.Y. Grading Excavation; 500 C.Y. Foundation Backfill; 6,500 C.Y. Protective Encasement Backfill; 75,000 C.Y. Roadway Excavation, Unclassified; 20,000 C.Y. Borrow Excavation for Roadway Fills; 50 L.F. 18" Concrete Drainage Pipe; 62 L.F. 21" Concrete Drainage Pipe; 128 L.F. 24" Concrete Drainage Pipe; 68 L.F. 30" Concrete Drainage Pipe; 185 L.F. 36" Concrete Drainage Pipe; 140 L.F. 42" Concrete Drainage Pipe; 264 L.F. 48" Concrete Drainage Pipe; 78 L.F. 54" Concrete Drainage Pipe; 30 L.F. 60" Concrete Drainage Pipe; 260 C.Y. Class "A" Concrete for Box Culverts; 18 C.Y. Class "A" Concrete for Headwalls; 20,527 S.Y. Soil Base Course; 18,474 S.Y. Double Bituminous Surface Treatment; 200 L.F. Encasement Pipe for 60" Steel Line.

ALTERNATE BID PROPOSAL

Generally same as Base Bid Proposal except Substitute 54" Steel Pipe Transmission Main for 60" Steel Pipe Transmission Main.

CONTRACT NO. TWO

BASE BID PROPOSAL

34,158 L.F. 60" Steel Pipe Transmission Main, ¼" Wall; 213 L.F. 60" Steel Pipe Transmission Main, 9/16" Wall; 324 L.F. 60" Steel Pipe Transmission Main, ⅜" Wall; 81 L.F. 60" Steel Pipe Transmission Main, 11/16" Wall; 99,000 lb. Steel Fabricated Bends; 60 Each Miter Cuts; 12 Each 6" Steel Pipe Blowoff Assemblies; 10 Each 12" Steel Pipe Blowoff Assemblies; 180 L.F. 6" Steel Pipe for Adjustment at Blowoff Assemblies; 130 L.F. 12" Steel Pipe for Adjustment at Blowoff Assemblies; 37 Each Standard Air and Vacuum Valve Assemblies, Type 1; 15 Each Standard Air and Vacuum Valve Assemblies, Type 2; 50 Each Manholes on Steel Pipe; 7 Each Cathodic Test Lead Station on Steel Pipe; 6 Each 36" Line Valve Assemblies; 1 L.S. Surge Control Installation at Station 688 + 00; 1 L.S. Surge Control Installation at Station 993 + 84; 1 L.S. Special Check Valve Installation at Cane Creek Control Reservoir; 1 L.S. River Crossing at Station 972 + 00; 38,000 Each Sack Breakers; 300 Each Joint Harness Sets for 60" Pipe; 1,550 C.Y. Unformed or Rough Formed Class "B" Concrete for Anchors, Thrust Blocks, etc.; 5,000 S.Y. Rip-Rap; 171 S.Y. Remove and Replace Pavement; 42,000 C.Y. Grading Excavation; 500 C.Y. Foundation Backfill; 7,500 C.Y. Protective Encasement Backfill; 65 L.F. 18" Concrete Drainage Pipe; 5 C.Y. Class "A" Concrete for Headwalls; 110 L.F. Encasement Pipe for 60" Steel Pipe.

ALTERNATE BID PROPOSAL

Generally same as Base Bid Proposal except Substitute 54" Steel Pipe Transmission Main for 60" Steel Pipe Transmission Main.

CONTRACT NO. THREE

BASE BID PROPOSAL

29,508 L.F. 60" Steel Pipe Transmission Main, ¼" Wall; 15,185 L.F. 60" Steel Pipe Transmission Main, 9/16" Wall; 16,174 L.F. 60" Steel Pipe Transmission Main, ⅜" Wall; 2,528 L.F. 60" Steel Pipe Transmission Main, 11/16" Wall; 51,000 lb. Steel Fabricated Bends; 10 Each 12" Steel Pipe Blowoff Assemblies; 60 Each Miter Cuts; 7 Each 6" Steel Pipe Blowoff Assemblies; 105 L.F. 6" Steel Pipe for Adjustment at Blowoff Assemblies; 150 L.F. 12" Steel Pipe for Adjustment at Blowoff Assemblies; 43 Each Standard Air and Vacuum Valve Assemblies, Type 1; 8 Each Standard Air and Vacuum Valve Assemblies, Type 2; 61 Each Manholes on Steel Pipe; 13 Each Cathodic Test Lead Stations on Steel Pipe; 3 Each 36" Line Valve Assemblies; 1 L.S. Surge Control Installation at Station 1162 + 87; 1 L.S. Surge Control Installation Station 1548 + 13; 1 L.S. Special Check Valve and Air Valve Installation at Station 1159 + 50; 1 L.S. River Crossing at Station 1470 + 00; 1 L.S. River Crossing at Station 1481 + 00; 1 L.S. River Crossing at Station 1500 + 00; 46,000 Each Sack Breakers; 228 Each Joint Harness Sets for 60" Pipe; 1,000 C.Y. Unformed or Rough Formed Class "B" Concrete for Anchors, Thrust Blocks, etc.; 5,000 S.Y. Rip-Rap; 221 S.Y. Remove and Replace Pavement; 12,000 C.Y. Grading Excavation; 500 C.Y. Foundation Backfill; 6,000 C.Y. Protective Encasement Backfill; 520 L.F. Encasement Pipe for 60" Steel Line.

ALTERNATE BID PROPOSAL

Generally same as Base Bid Proposal except Substitute 54" Steel Pipe Transmission Main for 60" Steel Pipe Transmission Main.

CONTRACT NO. FOUR

6,950 L.F. 48" Cast Iron Pipe Distribution Main; 43,560 L.F. 42" Cast Iron Pipe Distribution Main; 1,860 L.F. 36" Cast Iron Pipe Distribution Main; 700 L.F. 30" Cast Iron Pipe Distribution Main; 165 Tons Cast Iron Fittings; 8 Each Cast Iron Pipe Blowoff Assemblies; 200 L.F. 12" Cast Iron Pipe for Adjustment at Blowoff Assemblies; 24 Each Standard Air and Vacuum Valve Assemblies for Cast Iron Pipe; 700 L.F. 6" Cast Iron Pipe for Adjustment at Standard Air and Vacuum Valve Assemblies on Cast Iron Pipe; 1 Each 30" Line Valve Assemblies; 5 Each 24" Line Valve Assemblies; 1 L.F. Interconnecting Assembly on Cast Iron Pipe at Avenue "C" and 17th Street, Ensley; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 14th Street and Avenue "C"; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 17th Street and 27th Avenue; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 22nd Street and 27th Avenue; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 27th Street and 27th Avenue; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 29th Street and 28th Avenue; 1 L.S. Interconnecting Assembly on Cast Iron Pipe at 30th Place and 28th Avenue; 1 L.S. Interconnecting Assembly on Cast Iron Pipe on 30th Avenue East of Frisco Railroad; 1,000 Each Sack Breakers; 1,000 C.Y. Unformed or Rough Formed Class "B" Concrete for Anchors, Thrust Blocks, etc.; 5 MBF Lumber, Left in Trenches; 250 S.Y. Rip-Rap; 5,500 S.Y. Remove and Replace Pavement; 25,000 C.Y. Rock in Trenches on Cast Iron Mains; 22,500 C.Y. Grading Excavation; 160 L.F. Encasement Pipe for 48" Cast Iron Line; 1,560 L.F. Encasement Pipe for 42" Cast Iron Line.

CONTRACT NO. FIVE

BASE BID PROPOSAL

This Proposal embodies all of the work outlined under the Base Bid Proposals of Contracts 1, 2 and 3 above plus the work outlined under Contract No. 4.

ALTERNATE BID PROPOSAL

This Proposal embodies all of the work outlined under the Alternate Bid Proposals of Contracts 1, 2 and 3 above plus the work outlined under Contract No. 4.

A Performance Bond and Labor and Material Bond such as described in 1940 Code of Alabama, Title 56, Section 16, will be required of the successful bidder. Performance Bond must be in the penal amount of 100% of the Contract price and Labor and Material Bond in the penal amount of 50% of the Contract price. Same must be executed by a surety company acceptable to the Board and authorized to do business in the State of Alabama.

Attention of Bidders is called to 1940 Code of Alabama, Title 46, Section 65-82 as amended defining general contractors and dealing with their qualifications and licensing. Bids will be accepted from only those general contractors meeting the above code requirements.

Bids must be accompanied by a certified check or Bidder's Bond acceptable to the Owner in an amount not less than five (5) per cent of the base bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty days. Other requirements for bidders are set forth in the Specifications.

The Owner reserves the right to reject any and all bids, and to waive informalities.

THE INDUSTRIAL WATER BOARD OF THE CITY OF BIRMINGHAM, ALABAMA

By S. D. Moxley
Its Chairman

Attest: Louis B. Mackin, Secretary

J. W. Goodwin Engineering Company
2111 Seventh Avenue, South
Birmingham 3, Alabama

Bids: April 3, 1959

Govt. of District of Columbia, Dept. of Highways & Traffic, D. C.

March 6, 1959. SEALED PROPOSALS will be received in Room 404, 499 Pennsylvania Ave., N.W., Washington 1, D. C., until 2 PM, EST, April 3, 1959, and then publicly opened and read for Grading and Drainage of a Section of the proposed Anacostia Freeway, from Chesapeake Street, to D.C. Line. Fed. Aid Proj. Interstate I-295-2(18)0, consisting of approx. 82,300 sq. yds. Stabilized Soils Base Course 10" in compacted depth and 8,500 sq. yds. Stabilized Soils Base Course 12" in compacted depth. (Minimum wage rates for this project have been predetermined as required by law and are set forth in the bid proposal.) Proposal forms, plans and specifications obtainable from Supervisor, Bid & Contract Section, Procurement Office, D.C., Rm. 404, 499 Pennsylvania Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to D.C. Treasurer. (Phone NA 8-6000, Ext. 2378).

Bids: March 31, 1959

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. on Tuesday, March 31, 1959

For Throgs Neck Bridge Contract No. TN-12C, Bronx Plaza Roadway and Cinder Storage Structure, Borough of the Bronx. The bid must be accompanied by a deposit in the amount of $80,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $40.00, which will not be refunded.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-51671) will be received at Ephrata, Washington, until 10 a.m., Pacific Standard Time, April 14, 1959, for furnishing labor and materials for earthwork, concrete lining and structures, Block 201, laterals, wasteways and drains and White Bluffs Pumping Plant No. 2 and WB10A3 Pumping Plant, Wahluke Branch Canal Laterals, Columbia Basin Project, Washington. Location south of Othello, Washington. Principal items are 215,800 cu. yds. excavation; 24,600 cu. yds. backfill about structures, 1,130 cu. yds. concrete in structures, and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, P. O. Box 1, Ellensburg, Washington, P. O. Box 368, Ephrata, Washington, or Building 53, Denver Federal Center, Denver 25, Colorado. W. A. Dexheimer, Commissioner.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

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$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take 1/2 of above rate.
Box numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

• POSITIONS VACANT

Wanted: Qualified Clerk of Works for completely new general hospital with 73 beds. Bid price of $1,241,000 by well known Western New York contractor. Approximately 15 months duration for contract. Job starts about April 1, 1959. Salary open. Contact Wayne A. Manson, Administrator, Ira Davenport Memorial Hospital, Bath, New York. Phone PR 6-2141.

Grading Superintendent for Highway, Airport and Railroad Construction. Year-round employment, must be sober and experienced. Engineering background desired. Location, midwest. State age, education, background, experience and salary desired. P-1034, Engineering News-Record.

City Engineer—registered engineer with qual-ifying experience in supervision of sewage treatment plant, storm & sanitary sewers, street and sidewalk design and building code. Salary open as to qualifications. City Clerk, City Hall, Algona, Iowa.

Rock Tunnel Superintendent, for 5400 l.f. project Central New York. Will consider only first class man with broad, extensive background. Start immediately. P-1158, Engineering News-Record.

Civil engineer, graduate, with strong back-ground in design, plant control, placement bituminous concrete mixes. $8500-10,000 range. Give full information. P-1161, Engineering News-Record.

Draftsman-Estimator for growing Prestressed Concrete manufacturer on Central-South coast. Similar experience desirable but not essential. Architectural background with field experience desired. Good opportunity for man with initiative. Send resume to P-1168, Engineering News-Record.

Wanted: Engineer Estimator, Missouri Gen-eral Contractor, work in home office estimating heavy construction, highways, bridges, earth and concrete work. Give complete resume, age, education, references and experience. All replies confidential. P-1155, Engineering News-Record.

Wanted—Construction Superintendents: Long established midwest construction firm has opening for two or more qualified field construction superintendents. Engineering background preferred but not required. Applicants must be aggressive, cost-conscious and well grounded in reinforced concrete, structural steel and masonry structures. Complete education, experience data and salary expected should be furnished in first reply. P-1107, Engineering News-Record.

Men with experience in making quantity sur-veys from architectural plans and specifications needed by a large Oklahoma Industrial Firm. Preferably with steel or general contracting experience. Give full details of personal data and experience with first letter. P-1106, Engineering News-Record.

City Engineer—For City of 70,000 population located in southeastern Pennsylvania. Applicant must excel in sanitary engineering, and have knowledge of general municipal engineering problems. Applicant must qualify for Reg. in Penna. Furnish complete resume of education, experience and starting salary desired in first letter. Write P-1185, Engineering News-Record.

Assistant Director of Public Works, City of Delray Beach, Florida. Newly created position requires BSCE; some municipal experience desirable. Starting salary open, with $470 per month minimum. Send detailed resume of education, experience, age, date of availability, references, and recent photograph to the Director of Public Works, City Hall, Delray Beach, Florida.

Superintendent—Water And Sewers. Gradu-ate sanitary engineer wanted with minimum 3 years experience in an administrative capacity of water filtration plant and water system operations and/or sewage disposal systems. Salary range $6,408 to $7,356. Eligibility for Professional Engineers license preferred but not required. Send resume and application to City Administrator, City Hall, Batavia, New York.

Traffic Engineer—Immediate opportunity for a graduate Civil Engineer with three years' professional experience. Annual salary $7320-8804. Address experience resume to Kern County Personnel Department, 3805 Chester Ave., Bakersfield, California.

• POSITIONS VACANT

Assistant Chief Materials Testing Laboratory. To assist in planning and supervising the work of the chemical and physical testing units of the City of Philadelphia's materials testing lab. We require college graduation with major course work in engineering or physics and 4 years of experience in the physical and chemical testing of materials, including 2 years in a supervisory capacity. Equivalent combinations of exp. & educ. will be considered. Salary starts at $7265 per yr., regular increases, liberal fringe benefits. Send resume to Miss Alma Goldman, Room 975 City Hall, Phila. 7, Penna.

Assistant Engineer. Min. 3-5 yrs municipal experience. Location—Northern N. J. P-1216, Engineering News-Record.

Civil Engineer—Graduate C. E. or Equivalent with Experience in Surveying and Preparation of Maps. Age 30 to 50. For Employment in Land Department Office of Large Industrial Corporation in Alabama. Full Personal Data Desired with Reply. P-1237, Engineering News-Record.

Foreign Employment opportunities with American companies overseas. All Fields, high salaries; transportation paid. Write World Employment Information, Box 2545 Dept. X, Hollywood 28, Calif.

• POSITIONS WANTED

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Civil Engineer—Ten years experience. High-way, Municipal, Industrial Design; Licensed California. PW-1151, Engineering News-Record.

Construction Executive and General Superin-tendent, 25 years experience in commercial, industrial, public buildings, and mass housing, experience includes all phases of construction, job management, purchasing, subcontracting, processing of claims, etc. Desire permanent relocation eastern U. S. PW-1096, Engineering News-Record.

Office Manager—Accountant, 13 years experi-ence home office and field accounting, including joint venture work; financial statements, costs, insurance, subcontracts—all phases construction accounting. Age 36, married, settled. Presently employed. PW-1153, Engineering News-Record.

Jacksonville Area—Sales Engineer, 40. Civil 17 yrs. construction background includes military, industrial, public works, contracting and sales. Established Florida resident currently contacting specifying agencies and contractors. Desires employment with firm interested in increasing sales in S.E. territory. PW-1163, Engineering News-Record.

Resident or Field Engineer—Reg. P.E.—(Elec. & Mech.) Thermal & diesel plants, missile launchers, airfields, schools, industrials, communications. Design, construction & operating exper. PW-1116, Engineering News-Record.

Construction Supt. Broad experience in indus-trial, institutional, commercial building as supt., general supt. const. mgr. Available soon. PW-1110, Engineering News-Record.

Design Draftsman—7 years experience archi-tectural and steel—reply for resume. PW-1109, Engineering News-Record.

United Kingdom or Europe. Engineering administrator-supervisor. Extensive overseas experience. PW-1175, Engineering News-Record.

• POSITIONS WANTED

Canadian Civil Engineer—23—Single—With experience in industrial building and railway fieldwork desires foreign employment. PW-1074, Engineering News-Record.

Professor of Structural Engineering, 16 years experience teaching and industry, age 36, desires teaching position. PW-1079, Engineering News-Record.

Electrical Engineer: Recently unemployed due to completion of construction program and R.I.F. Thirty-five years experience all phases of electrical and mechanical construction and operation. Married, no children, free to travel. Excellent health. Layout and design. Prefer field and construction. PW-1094, Engineering News-Record.

Engineer B.S.C.E., 44, desires position in Central or Western Europe. Heavy experience in grading, paving, const., machy. and control. No design. 3 completed foreign contracts. Some French. $10,000 per annum minimum. Resume on request. PW-1058, Engineering News-Record.

Production Engineer: 7 years engineering and supervisory experience with manufacturer of prestressed concrete products. Desires similar position leading to Engineering Management. PW-1169, Engineering News-Record.

Experienced estimator looking for established contractor who needs engineer to prepare estimates. Graduate, registered, well equipped by training and experience to handle estimating and purchasing for all types of heavy industrial, commercial, and public works projects. References exchanged. Will relocate. PW-1186, Engineering News-Record.

Construction Sales 12 years experience in procuring work negotiating contracts and contact work for heavy construction company available within one month. PW-1141, Engineering News-Record.

Dock Building and Pile Driving Superintend-ent and estimator available for work at once 17 years experience mostly with small concern. Interested in permanent position. PW-1147, Engineering News-Record.

Senior Highway Designer or Project Engi-neer—Age 50. Thorough knowledge of modern multi-lane and interchange design. Registered Georgia and Florida. Southeast. Available March 15. PW-1116, Engineering News-Record.

General Superintendent—20 years heavy con-struction experience large chemical plants, powerstations, process piping, instrumentation, airconditioning 500-5000 tons. PW-1193, Engineering News-Record.

BCE, 30, married; 6 1/2 yrs. chem. plant const. & modification. Desire Florida location with construction or consulting firm. Experienced in structural, architectural and mechanical phases of const. PW-1232, Engineering News-Record.

Office Manager-Accountant Field or Main Office, Domestic or foreign. Heavy Const. Taxes, Payroll Cost, Timekeeping, Purchasing, Insurance. PW-1231, Engineering News-Record.

Equipment Superintendent for all types of construction equipment, 24 years experience in maintenance, purchasing, and labor relations. Also designing and building of special equipment. Would prefer a position in the lower east coast of Florida from Palm Beach to Miami but will also consider other parts of the country or foreign work. Can furnish highest references. PW-1221, Engineering News-Record.

(Continued on the following page)

ENGINEERS

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PREFER GRADUATE REGISTERED ENGINEERS WHO SEEK LONG RANGE EMPLOYMENT WITH AMPLE OPPORTUNITY FOR PROFESSIONAL DEVELOPMENT AND ADVANCEMENT IN A STEADILY EXPANDING AND GROWING ORGANIZATION.

Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income and other benefits. Blue Cross & Blue Shield Available. Moving allowance.

Work will be in the general offices in St. Louis. Interviews can be arranged in Washington, D. C., and San Francisco also.

Please write fully, including salary data, to

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Career opportunities for individuals interested in professional recognition, ample opportunity for advancement based on merit, plus employee retirement plan, group life insurance, hospitalization, paid vacation and holidays.

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Nationally known organization offers excellent opportunity for young civil engineer graduate. Engineering consulting and promotional work in highway and concrete fields. Location Ohio, Pennsylvania and W. Virginia area. Car allowance and expenses. Permanent position. Salary based on qualifications and experience.

P-1042, Engineering News-Record Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PROFESSIONAL CIVIL ENGINEER
$7135-$8632

Age 26–55. B.S.C.E. preferred. Must be eligible for immediate registration in Ohio. Minimum 4 years experience preferred in municipal, sanitary, subdivision, or related work. Ability to design, write specifications, prepare estimates, and supervise construction.

ENGINEERING AIDE IV
$5802-$7050

Age 22–35. B.S.C.E. and or engineer in training certificate. For survey, design, and construction streets, sewers, and public works projects.

Submit complete resume to Personnel Officer, Municipal Building, Hamilton, Ohio.

Superintendents for Northern California

Graduate Engineers with 3 or more years job supervision experience in underground or water and sewer treatment plant field. Interested only in young, aggressive field men who will enjoy living and traveling in beautiful Northern California. Looking for supervisors, not designers. Send resume to P. O. Box 1562, Santa Rosa, California.

• *POSITIONS WANTED*

Administrator—12 years field office experience in all phases of general construction-mobile. PW-1223, Engineering News-Record.

Construction Engineer available 1st of May. C.E. degree from Tri-State College 1950. Broad experiences in industrial building—both field & office. Prefer overseas assignment but will consider domestic job. Present Salary $185/wk. PW-1220, Engineering News-Record.

Construction Manager: 20 years experience all phases; positions successfully held: Field Engineer, Superintendent, General Superintendent and Project Manager. PW-1218, Engineering News-Record.

Civil Engineer, age 35, B.S.C.E. Twelve years experience that includes office procedure, drafting, surveying, building construction, electrical distribution, steel design, and hwy. field construction with responsibilities and opportunities for advancement. Excellent references. Preferable location—Northeast U.S. section. PW-1215, Engineering News-Record.

Estimator-Construction Engineer. B.S.C.E., 20 years heavy and industrial construction. Will relocate. PW-1238, Engineering News-Record.

Executive. Established Ability And Extensive experience, 25 years in all phases of heavy construction from field supervision to complete administration of large U.S. and foreign projects, including contract negotiations and processing claims. Inquiries solicited. PW-1239, Engineering News-Record.

Civil Engineer B.S.C.E., P.E., 34. 10 years steel mill and industrial construction experience. Competent in field supervision and layout. Available on short notice as superintendent or field engineer. PW-1240, Engineering News-Record.

• *WORK WANTED*

Artic project staff consisting of supt., eng. Also foremen for construction and mechanical trades. Experience D.E.W. line, pine tree line, mining, airstrips, bridges, pipeline, docks, etc. Reply P.O. Box 12, Downsview, Ontario, Canada.

ASSISTANT TREASURER

Assistant treasurer to assume responsibility for accounting department; budgetary cost control experience important; familiarity with accounting procedures in construction and real estate development fields, including mortgages, leasebacks helpful but not essential. Need man with initiative in contributing to management thinking in coordinating efforts of various departments. Salary open. Must be willing to relocate in Florida. Send complete resume and references. Interview by appointment only. All inquiries treated in confidence.

Joseph F. Cairnes, *President*

PERINI-WESTWARD DEVELOPERS, Inc.
P. O. Box 1071
West Palm Beach, Florida

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IMMEDIATE OPENINGS FOR

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CHEMICAL ENGINEERS
Experienced in Refinery & Chemical Process Design
Also
MECHANICAL ENGINEERS
Experienced in Design of Sintering Machines and Heavy Steel Making Equipment & Machinery.

Send Resume & Photo to: G. Victor Hopkins

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2300 Chester Cleveland 1, Ohio

***WANTED* HIGHWAY DESIGNERS, PROJECT DESIGN ENGINEER & HIGHWAY DRAINAGE ENGINEER**

To Assume Responsibility for Complete Highway Projects

MACCABEE CAMPBELL & ASSOC.
173 W. Madison St. Chicago 2

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An exclusive association for foreign construction workers. Membership is a must. Current authenticated data on all foreign construction projects. Write for free details.

Overseas Americans Inc., 7 West 44 St., New York 36, N. Y. Dept. K

HYDROLOGIC ENGINEER

Five to ten years experience; minimum two, preferably five with USGS. Considerable foreign travel. Salary open. Send complete personal and experience record to Personnel Manager.

HARZA ENGINEERING COMPANY
400 W. Madison St., Chicago 6, Illinois

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EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

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$2.40 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

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NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• BUSINESS OPPORTUNITIES

Land Surveying—Old established business in Passaic County, N. J.; city and country work; owner 67 finds some of work too strenuous; will sell for $28,000 including 7-room home and office in nice neighborhood; might consider partnership. BO-1180, Engineering News-Record.

Consulting Engineer wants to acquire small consulting firm whose principal wishes to retire. BO-1235, Engineering News-Record.

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
Steam Pile Hammers and Extractors

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• STEEL LEADS • PILE DRIVER HOSE • STEEL SHEET PILING

CONMACO, INC.

DRexel 1-3930
820A KANSAS AVE.,
KANSAS CITY, KANS.

Concrete Ready Mix Plant

Complete modern equipment and buildings. In southern tier of New York State. Priced right as owner is retiring.

BO-1195, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOR SALE
DRILL SHARPENERS & JACKBITS
Model 1R 40 complete with shank and bit punch and two sets of shanking devices for 1" and 1¼" hollow steel Jackbits. Type 1, center hole, 1¼ to 2⅜". Sacrifice prices. Write for lists.
JULIUS M. FOGELMAN
1619 Perk. Ave. Reading, Penna.

USED EQUIPMENT

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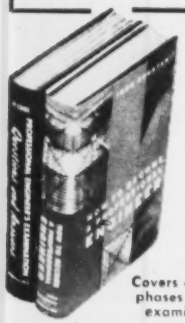

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Editorials

Cost and Wages

THE BUILDING COST REPORT in this issue makes one thing very clear: Wage increases are exerting the greatest upward force on the cost of construction. And a survey of employers (see p. 258) indicates a resignation on their part to go along with asked for pay.

But there's an "if" expressed, and rightly so. Contractors want a day's work for a day's pay. Unless they get productivity that is profitable they can't pay the wages demanded and still stay in business. And what is true for contractors is also true for the manufacturers of the materials the contractor uses. Their need, as discussed below, is for increased productivity to compete successfully against more cheaply produced foreign materials.

As Materials Imports Increase

INCREASING IMPORTS of low priced construction materials from abroad may be helping some contractors to produce lower bids, but they are giving U. S. materials manufacturers growing cause for concern. In some materials, such as nails, strands and reinforcing bars, foreign competition is beginning to hurt (ENR Mar. 12, p. 21). What can be done about it without damaging our own necessary export trade is a thorny question. A solution will nevertheless be sought by the affected manufacturers.

The natural inclination to turn to government for help is already apparent. Some states have, in fact, passed legislation to curb foreign goods, and others are considering it. Some manufacturers are petitioning the U. S. Tariff Commission to set high import duties.

Yet neither of these approaches promises more than limited and temporary help since they are wholly defensive. Moreover, the states cannot stop the flow of lower priced foreign goods sufficiently, and about all the federal government can do is to attempt some revisions of our reciprocal trade agreements with foreign governments. The possible results are not encouraging.

Nor can much hope be held out for patriotic appeals to "Buy American." Contractors and owners plagued with high costs are too prone to grasp for any price advantage so long as satisfactory quality is assured.

What then can be done? While there may be several paths to a solution all must aim at two objectives: (1) to improve U. S. production sufficiently to lower costs below those of comparable foreign products; and (2) to improve the quality and characteristics of U. S. products so that purchasers get more for their money.

Getting production costs down while still paying high U. S. wages will not be easy, yet economies must be sought through more improvements in tools and machinery. As to quality: Since the general acceptance of ASTM standards there has been a tendency among construction material manufacturers to fashion their products to just the minimum requirements of these standards. Under the pressure of competition from abroad, perhaps this situation should be changed. U. S. products may be satisfactory at present, but they could be better.

A good answer to the import threat, therefore, is more research and development to the end that lower-cost production and better products will make foreign materials less attractive. Restrictions of imports may be necessary as an emergency measure, but they offer no permanent solution to the foreign competition problem.

Space Age Teamwork

OPPORTUNITIES FOR CONSTRUCTION in the up-coming Space Age were reviewed in the March 5 issue, p. 21. Some are already real, while others, still distant, are nevertheless reachable.

The real opportunities, here now, are obvious—design and construction of the ground-support facilities needed to study, make, store, launch and track the satellites which are being hurled skyward in increasing numbers.

The reachable opportunities, on the other hand, are not so tangible, but a little imagination can make them apparent. Assembling a framework out in space beyond the effect of earthly pull and under unfamiliar conditions is, of course, quite different from gravity-aided erection. Yet space assembly can be classified as construction—brought into construction's orbit if presently earthbound construction people grasp the opportunity soon enough.

Civil engineers and construction people who adopt a doubting attitude about space platforms and moon station risk doing themselves and their profession a disservice. For unless civil engineers actually reach for the opportunities that the Space Age may bring, they can deal themselves out of a building job that may be of commanding importance in the future.

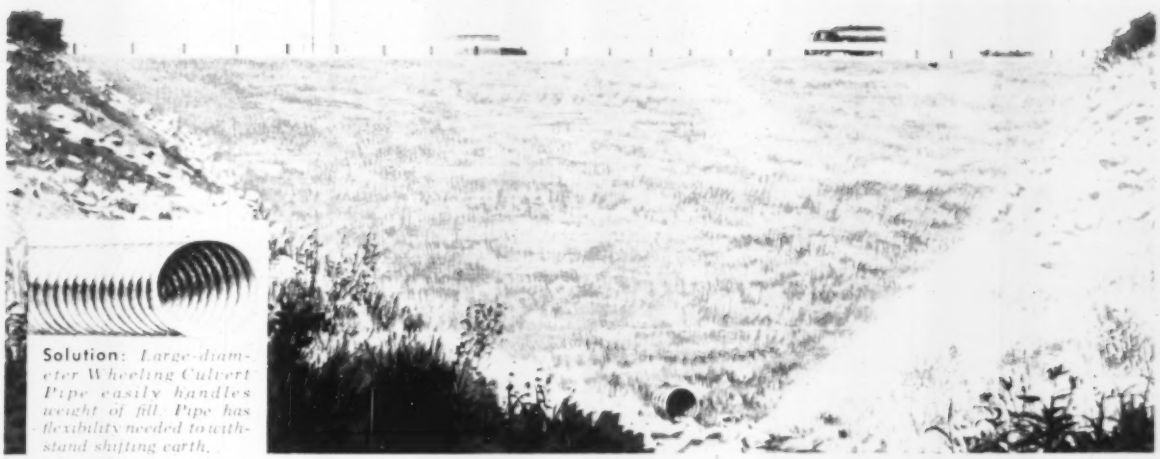
That some construction people are thinking seriously of these opportunities was revealed by two of those interviewed for the above-mentioned article. One predicted that "there will be heavy competition between construction firms and the missile and electronic firms for space contracts." And the second stated—with more depth of thought than the first—"there is a role here for construction people, but they must first realize they'll have an electronic as well as a civil engineering responsibility."

It is this responsibility—to embrace new and added fields of knowledge in electronics, astronautics or whatever—that looms before the civil engineer at the dawn of the Space Age. It is not a new kind of responsibility for he has met it before when mechanical, electrical and chemical engineering were new. Then he fitted himself to be a member—often a leader—of a team of specialists. To day's civil engineer faces the same challenge again.

METAL CULVERT PIPE BY WHEELING

Problem: *How to drain this deep draw without using costly bridge. Difficulty is increased because of shifting earth.*

Have to drain deep, shifting fills?



Solution: *Large-diameter Wheeling Culvert Pipe easily handles weight of fill. Pipe has flexibility needed to withstand shifting earth.*

Use this flexible metal culvert pipe!

Wheeling Pipe Arch—a wide, comparatively flat-bottom type of corrugated metal pipe for use where headroom is limited.

Small-diameter Wheeling Metal Pipe ideal for farm and home drainage requirements.

Although ordinary heavy, rigid pipe *looks* stronger, it often cracks and breaks under deep or shifting fill. *But not Wheeling Corrugated Metal Culvert Pipe!*

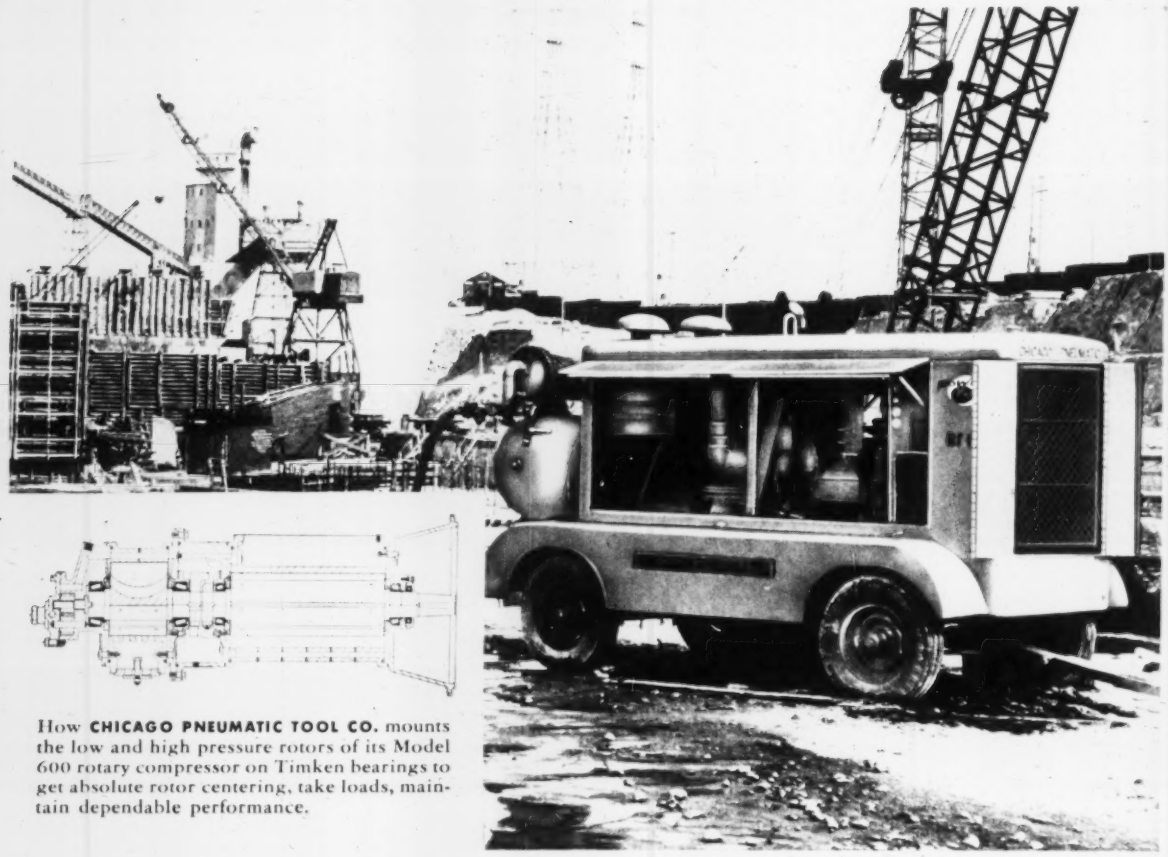
Flexible Wheeling Pipe adjusts to changing pressures. Amazingly strong because it uses the surrounding earth to help carry the load.

Wheeling Metal Culvert Pipe or Pipe Arch comes in copper-bearing steel or copper-bearing pure iron, plain galvanized or bituminous coated (with or without paved invert). Available in a wide range of gauges and diameters.

Ask your nearby Wheeling culvert plant, warehouse or sales office for full details. Wheeling Corrugating Company, Wheeling, West Virginia.

WHEELING CORRUGATING COMPANY · IT'S WHEELING STEEL!

Immediate delivery on all stocked items from these warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Madison, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis*; Sales Offices: *Atlanta, Houston*



How **CHICAGO PNEUMATIC TOOL CO.** mounts the low and high pressure rotors of its Model 600 rotary compressor on Timken bearings to get absolute rotor centering, take loads, maintain dependable performance.

Today contractors get dependable air power—compressor gets perfect rotor centering with TIMKEN® bearings

CHICAGO Pneumatic Rotary Compressors prove themselves to be real workhorses when "killing" construction jobs demand around-the-clock performance with no room for failure. One of the reasons for their success is that Timken® tapered roller bearings keep them rolling.

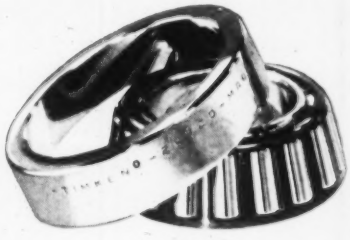
Each cylinder of these two-stage compressors contains a high-speed rotor that must be perfectly centered between its end plates, and end plate clearances are close. Timken roller bearings prevent any axial movement, yet take radial and thrust loads in any combination.

Timken bearings virtually eliminate friction. They're geometrically designed to have true rolling motion, and precision-made to live up to their design. They make closures more effective, too. Dirt, dust and moisture can't get in; lubricant can't get out. Maintenance is further reduced.

To get the finest bearing steel, we make our own electric furnace fine alloy steel. We're America's only bearing manufacturer that takes this extra step to safeguard quality from melt of steel to finished product.

So to get your No. 1 bearing value, specify bearings trade-marked "TIMKEN". They make any machine better, because Better-ness rolls on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.



TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD